Drug consumption among medical students in São Paulo, Brazil: influences of gender and academic year

Consumo de drogas entre estudantes de medicina em São Paulo: influências de gênero e ano letivo

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Abstract

*Objective: To analyze alcohol, tobacco and other drug use among medical students. **Method:** Over a five-year period (1996-2001), we evaluated 457 students at the Universidade de São Paulo School of Medicine, located in São Paulo, Brazil. The students participated by filling out an anonymous questionnaire on drug use (lifetime, previous 12 months and previous 30 days). The influence that gender and academic year have on drug use was also analyzed. **Results:** During the study period, there was an increase in the use of illicit drugs, especially inhalants and amphetamines, among the medical students evaluated. Drug use (except that of marijuana and inhalants) was comparable between the genders, and academic year was an important influencing factor. **Discussion:** Increased inhalant use was observed among the medical students, especially among males and students in the early undergraduate years. This is suggestive of a specific behavioral pattern among medical students. Our findings corroborate those of previous studies. **Conclusion:** Inhalant use is on the rise among medical students at the Universidade de São Paulo School of Medicine. Because of the negative health effects of illicit drug use, further studies are needed in order to deepen the understanding of this phenomenon and to facilitate the development of preventive measures.*

Descriptors: Students, medical; Street drugs; Sex distribution; Epidemiology; Administration, inhalation

Resumo

*Objetivo: Analisar o consumo de álcool, tabaco e outras drogas entre os estudantes de Medicina da Faculdade de Medicina da Universidade de São Paulo dentro de um período de cinco anos (1996-2001). **Método:** Participaram 457 universitários que responderam a um questionário anônimo sobre o uso de drogas (medidas: uso na vida, nos últimos 12 meses e nos últimos 30 dias). A influência do gênero e do ano letivo do universitário sobre o uso de drogas também foi analisada. **Resultados:** Em cinco anos, houve um aumento do uso de drogas ilegais entre os estudantes de Medicina da Faculdade de Medicina da Universidade de São Paulo, especialmente de inalantes e anfetaminas. Há uma convergência desse consumo entre os gêneros (exceto para maconha e inalantes) e o ano letivo é fator interferente de relevância. **Discussão:** Entre os estudantes de Medicina da Faculdade de Medicina da Universidade de São Paulo, observou-se um aumento do uso de inalantes, especialmente entre os alunos do sexo masculino e dos primeiros anos de graduação. Sugere-se que seja um comportamento específico dos estudantes de Medicina, tendo corroborado com os resultados de estudos prévios. **Conclusão:** O uso de inalantes é crescente entre os universitários de Medicina da Faculdade de Medicina da Universidade de São Paulo. Devido aos seus efeitos nocivos sobre a saúde, outros estudos são necessários para aprofundar a compreensão desse fenômeno, assim como para que sejam desenvolvidas medidas de prevenção que interrompam sua evolução.*

Descritores: Estudantes de medicina; Drogas ilícitas; Gênero e saúde; Epidemiologia; Inalação

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Introduction

Every year, approximately 5% of the world population between 15 and 64 years of age reports using at least one illicit drug, roughly corresponding to 200 million people. Among illicit drugs, marijuana is the most widely used, with a prevalence of 3.8% (158.8 million people), compared with 0.6% for amphetamines, 0.6% for opiates, 0.3% for cocaine, 0.3% for heroin and 0.2% for ecstasy.[1]

Young adults deserve special attention, especially those who are university students. Considering the positions that university students will attain in society and the development that they represent as a whole, determining their opinions and attitudes toward alcohol and drugs, as well as the prevalence of the use of these substances among students, can provide information that increases the overall understanding of student behavior. This facilitates the planning of appropriate intervention measures and public policies for controlling alcohol and drug use/abuse among university students.

In the United States, the importance of this issue has been demonstrated through the planning and development of the "Monitoring the Future Surveys" project. For 27 years, these prospective studies have analyzed the prevalence of alcohol and other drug use among students, from junior high school to adulthood, focusing on university life.[2] The results of this project have shown that, among university students, the prevalence rates of lifetime alcohol use and lifetime illicit drug use have decreased over time, although they remain higher than those observed for the general population (84.7% and 50.6%, respectively, *vs.* 82.9% and 45.4%).[3] These differences have drawn the attention of health authorities. In addition, the authors of the "Harvard School of Public Health College Alcohol Study", who surveyed a nationally representative sample of students enrolled in four-year university courses in the United States four times between 1993 and 2001, reported that heavy drinking continues to be a problem among university students and recommended that preventive measures be implemented.[4]

Illicit drug use is also prevalent in Latin America, where the prevalence rates of alcohol, tobacco and other drug use (lifetime use and use in the previous 12 months) are highest among young adults aged 18 to 24 years, university students in particular.[5,6] For example, in Chile and Peru, the annual prevalence of marijuana use is three times higher and two times greater, respectively among people aged 18 to 24 years than in the general population (16.0 *vs.* 5.3% and 6.8 *vs.* 3.3%, respectively). In those countries, the annual prevalence of cocaine use is twice as high among young adults as in the general population.[6,7]

São Paulo, the nineteenth richest city in the world, as well as the leading financial center and corporate market in Latin America, is home to the Universidade de São Paulo (USP), one of the major Latin American universities, and its medical school, the *Faculdade de Medicina da Universidade de São Paulo* (FMUSP, University of São Paulo School of Medicine).[8,9] In 1996 and 2001, two independent, campus-wide cross-sectional studies were carried out to determine the prevalence of legal and illicit drug use among university students at USP.[10,11] These surveys found that the lifetime use of alcohol, tobacco, marijuana, inhalants, hallucinogens, amphetamines, anticholinergics and opiates has increased among students at USP, having surpassed that observed among similarly aged adults in the general population.[12] In addition, the lifetime use of illicit drugs was found to be greater among male students than among female students,[10,11] suggesting that males are at greater risk for this type of consumption. From 1996 to 2001, this gender-related difference increased for the consumption of tobacco, marijuana, hallucinogens, amphetamines, anticholinergics, tranquilizers and inhalants.[13] In addition to these important cross-sectional surveys conducted at USP, many other relevant Brazilian studies[13-24] have contributed to the understanding of drug consumption among university students.

Drug consumption among medical students is of special interest, since their behavior, attitudes and beliefs do not reflect their greater access to scientific information, especially in comparison with other populations in the same age range. In reality, medical students have revealed significant vulnerability with regard to engaging in health risk behavior,[21] a paradoxical situation that has been a matter for concern worldwide[21-38] and in Brazil.[14-19,39-45]

A cross-sectional study on drug use among medical students at FMUSP, carried out in 1991, 1992 and 1993, found that alcohol, tobacco, marijuana, inhalants and tranquilizers were the drugs most commonly consumed.[39] The medical students consumed these drugs with the aim of improving academic performance, reducing fatigue, alleviating psychological tension and compensating for the lack of leisure time commonly observed among such students.[22,40]

Among the risk factors for drug consumption attributed to medical courses, the relevance of the academic year has recently been identified as a relevant factor.[16,19,39,46] The academic year has been found to influence not only drug consumption but also clinical practice, especially patient counseling regarding the effects and consequences of alcohol and illicit drug use. According to data from a recent American survey, as the medical course progresses, such counseling decreased in importance among students hoping to work in primary care, dropping from 76% to 59%, and from 52% to 39% for students in other specialties. This deficit in clinical practice seems to have a direct association with alcohol consumption among students, since heavy drinkers are more prone to discount the importance of counseling than are moderate drinkers or abstainers.[46] In addition, because of their chosen profession, medical students tend to be more tolerant toward their own alcohol and illicit drug consumption, believing themselves to be less susceptible to the consequences of their use.[42]

Drug consumption in the medical profession is not limited to the university years; it touches the lives of many established physicians and causes a broad spectrum of problems. A study involving physicians working in São Paulo revealed that drug dependence leads to problems such as unemployment (in 21.6%), difficulties in practicing professional activities (in 63.5%), conflicts with the Regional Council of Medicine (in 13%), psychiatric hospital admission (in 31.2%), self-medication (in 71.8%) and the need to change the field of specialization (in 9.3%).[47]

The evolution of drug consumption among medical students is an issue that deserves attention. Characterizing and monitoring that consumption is an important objective. Since substance use could have an impact on the conduct, reliability and efficiency of future physicians, understanding such use will contribute to developing early detection and intervention strategies to prevent drug use and abuse, thereby avoiding the related personal and social problems.

Method

Two independent cross-sectional studies were carried out in 1996 and 2001 to identify drug use (lifetime, previous 12 months and previous 30 days) among students enrolled at FMUSP. Based on the results of those surveys, we compared drug consumption among medical students in 1996 with that reported for medical students in 2001. Effects relating to gender and academic year were also analyzed.

1. Ethics

The project was approved by the Research Ethics Committee of the FMUSP Department of Psychiatry (protocol no. 371/00).

2. Study design and participants

Two cross-sectional studies were carried out independently in 1996 and 2001, with the participation of students at the São Paulo campus of USP. The sample was stratified by subject area (Humanities, Exact Sciences and Biological Sciences), current term and student gender. The samples were representative of the overall population of students at USP and also of that within each of the university schools (FMUSP; Institute of Psychology; Nursing School; etc.) Students were selected through systematic random sampling. Their participation was voluntary and they were only included in the study after all of its aims had been properly explained. All participating students gave written informed consent. To ensure anonymity, student names were not disclosed.

According to the USP Statistical Yearbook, there were 29,305 enrolled students in 1996 and 32,984 enrolled students in 2001. In order to determine the number of students to be interviewed within each subject area, it was established that the sampling error between a given percentage (obtained for the sample) and its corresponding value in the target population should not exceed 0.05, with a confidence interval of 95% (95% CI). To compensate for possible losses, an additional 20% was added to the estimated size of both samples. Therefore, drug consumption at USP was investigated through analysis of 5,391 valid questionnaires: 2,564 from 1996 and 2,827 from 2001.

For the current study, we evaluated data related to 457 FMUSP students: 248 in 1996 and 209 in 2001, distributed according to gender (240 men; 217 women) and academic year. In Brazil, the medical course lasts for six years. To identify the influence of academic year on drug consumption measurements, the samples were divided into two groups: the early-years group (first, second and third academic years) consisting of 286 students (151 in 1996 and 135 in 2001) and the later-years group (fourth, fifth and sixth academic years) consisting of 171 students (97 in 1996 and 74 in 2001). This division was made because a survey conducted earlier (in the 1991-1993 period) had demonstrated that the consumption of alcohol, tobacco and illicit drugs was more prevalent among students in the third, fourth, fifth and sixth academic years.[39]

3. Main outcome measures

The students were asked to complete an anonymous self-report questionnaire regarding legal and illicit drug use within their lifetime, within the previous 12 months and within the previous 30 days. Drug consumption was assessed by means of the question "Have you used—at any time in your life, in the last 12 months or in the last 30 days—[name of the drug] without medical guidance?" The following substances were surveyed: alcohol; tobacco; marijuana (and hashish); hallucinogens (LSD, mushroom tea, mescaline); cocaine; crack cocaine; amphetamines (Hipofagin®, Moderex®, Dualid S®, Inibex®, Desobesi®, Reactivan®, Pervetin®, Preludin®, Privina®, Aturgyl® and weight loss formulas); anticholinergics (Artane® and Akineton®); tranquilizers, anxiolytics and anticonvulsive drugs (Diazepam®, Diempax®, Valium®, Librium®, Lorax®, Rohypnol®, Somalium® and Lexotan®); opiates (Dolantin®, Meperidine®, Demerol®, Algafan®, heroin, morphine, opium and codeine-based medicines); sedatives and barbiturates (Optalidon®, Gardenal®, Tonopan®, Nembutal®, Comital® and Pentotal®); anabolic steroids (Cobactin®, Deca-Durabolin®, Zinabol®

and Enzivital®); and inhalants (glue, thinner, ether, chloroform, benzene, nail polish, gasoline and other volatile substances).

In both surveys (1996 and 2001), the questionnaire was identical except for the inclusion of ecstasy among the substances studied in 2001.[11] The participants were assured that the information would remain confidential, in order to increase the validity of responses.[48] Other students at USP (none of whom were among the selected interviewees or studied at FMUSP) were recruited and trained in the application of the questionnaire. These assistants went to classrooms and invited the selected students to participate. First, they explained the study objectives, gave assurance that the information would remain confidential and asked participants to read and sign the informed consent statement. Finally, those who agreed to participate deposited the completed questionnaire in a box placed at the front of the classroom.

4. Statistical procedures

Since both survey samples (in 1996 and in 2001) were independent, the possibility of response overlaps was not considered in the statistical analyses.

The drug consumption measurements were analyzed separately for the general population (at FMUSP), between genders and according to academic year (early years: first to third years; later years: fourth to sixth years). The 95% CIs were also calculated. Comparisons of the measurements between the two surveys, genders and academic year categories were made using Fisher's Exact Test, adopting a significance level of 5%.

Drug consumption rate comparisons between FMUSP and general USP students were also made, independent of the undergraduate course or subject area (Humanities, Exact Sciences or Biological Sciences). For this analysis, the population weights attributed to the different strata (the subject area in the USP sample) in 1996 and 2001[10,11,13] were reconsidered, and were recalculated for the entire USP student population, minus the FMUSP students. Thus, the new weights for 1996 and 2001, respectively, were as follows: 0.581 and 0.594 for Humanities; 0.280 and 0.263 for Exact Sciences; 0.139 and 0.143 for Biological Sciences (minus Medicine).

Results

1. Sociodemographic data

1) FMUSP

The 1996 student sample was similar to the 2001 student sample in many ways. Regarding gender distribution, males accounted for 129 (52.0%) of the 248 students in the first survey, compared with 111 (53.4%) of the 209 students in the second survey. Most of the students at FMUSP were 20-24 years of age and single. More than 50% of the sample came from families that earned more than 31 times the national minimum wage. There were no statistical differences between men and women, in either year, regarding sociodemographic data (Table 1).

2) Inter-group comparison

As can be seen in Table 2, the proportion of males in the later-years group was significantly greater in the second survey (p < 0.01). As expected, the age distribution was different between the two groups and between the two surveys (p < 0.001). Marital status and family income were similar for the two groups and in both surveys.

3) Comparison between the FMUSP and USP samples

Table 3 shows a comparison between FMUSP students and other USP students. The mean age of students in other courses was slightly greater (p < 0.001). In both surveys (1996 and 2001), the proportion of married students was also greater among

Table 1 - Age, marital status and family income distribution among medical students, by gender and survey year (1996 and 2001)

Variable	1996					2001				
	Male	Mean	Female	Mean	p	Male	Mean	Female	Mean	p
Age in years (n)	132		120			110		97		
15-19, %	24.2		26.7			9.1		15.5		
20-24, %	72.0	21.0	69.2	21.0	0.888	86.4	21.8	79.4	21.5	0.354
25-29, %	3.8		4.1			4.5		5.1		
Marital Status (n)	132		120			111		97		
Single, %	100.0		97.5		0.107	98.2		97.9		> 0.999
Married, %	0.0		2.5			1.8		2.1		
Family income (n)	127		107			106		88		
0-10× MW, %	4.7		7.5			7.5		13.6		
11-20× MW, %	15.8		19.6			17.0		15.9		
21-30× MW, %	22.0	32.4	19.6	29.7	0.132	19.8	31.7	21.6	28.6	0.284
31-40× MW, %	15.8		25.2			12.3		18.2		
More than 40× MW, %	41.7		28.1			43.4		30.7		

MW: minimum wage

other USP students (p < 0.001). In addition, family income was higher among FMUSP students than among other USP students (p < 0.001). This same USP student sample has been examined in greater detail in previous studies.[10,11,13]

2. Drug use

1) Alcohol and tobacco

Although the prevalence of alcohol consumption (lifetime, previous 12 months and previous 30 days) among the medical students was high in both surveys, no statistical difference was observed between 1996 and 2001 (Table 4). Therefore, alcohol consumption remained stable over the period analyzed. The same was observed for tobacco consumption.

2) Illicit drugs

Among the medical students, lifetime use of illicit drugs rose from 36.1% in 1996 to 43.8% in 2001, a difference that did not reach statistical significance (p = 0.099; Table 4). However, it is of note that approximately 4 out of 10 medical students reported having tried drugs at least once in their lives. In both surveys,

considering only illicit substance use, marijuana and inhalants were the substances most commonly consumed.

Over the period from 1996 to 2001, there were significant increases in the lifetime use of inhalants (from 19.0% to 32.9%; p = 0.001) and amphetamines (from 4.4% to 9.5%; p = 0.038). Regarding the previous 12 months, there were also increases in the use of inhalants (from 15.0% to 24.3%; p = 0.013) and amphetamines (from 3.2% to 7.6%; p = 0.036). Therefore, inhalants and amphetamines were the substances that showed the greatest increases in consumption between 1996 and 2001. Finally, the consumption of ecstasy was measured only in 2001 and was relatively low among medical students at that time (lifetime: 2.4%; previous 12 months: 1.0%; previous 30 days: 0.0%).

3. Gender-related effects on drug consumption

Table 5 shows the consumption of alcohol, tobacco and other drugs among medical students at FMUSP, by gender.

Lifetime use of marijuana was significantly higher among men than among women in 1996 (32.6% *vs.* 20.8%; p = 0.046) and

Table 2 - Gender, age range, marital status and family income among medical students, by academic year group and by survey year

Variable	1996					2001				
	Early-years	Mean	Later-years	Mean	p	Early-years	Mean	Later-years	Mean	p
Gender (n)	153		99			135		73		
Male, %	51.0		54.5		0.607	46.7		65.8		0.009
Female, %	49.0		45.5			53.3		34.2		
Age in years (n)	132		120			111		97		
15-19, %	41.8		0.0			18.5		0.0		
20-24, %	56.2	20.0	92.9	22.4	< 0.001	79.3	21.2	90.4	22.5	< 0.001
25-29, %	2.0		7.1			2.2		9.6		
Marital status (n)	153		99			135		74		
Single, %	100.0		97.0		0.059	98.5		97.4		0.616
Married, %	0.0		3.0			1.5		2.6		
Family income (n)	141		93			125		70		
0-10× MW, %	4.2		8.6			11.2		8.6		
11-20× MW, %	18.4		16.1			12.8		22.9		
21-30× MW, %	21.3	31.5	20.4	30.7	0.736	22.4	30.5	17.1	30.1	0.324
31-40× MW, %	20.6		19.4			16.8		11.4		
More than 40× MW, %	35.5		35.5			36.8		40.0		

Early-years: first to third academic years group; Later-years: fourth to sixth academic years group; MW: minimum wage

Table 3 - Gender, age range, marital status and family income among medical students and other university students, by survey year

Variable	1996					2001				
	Medical	Mean	Other	Mean	p	Medical	Mean	Other	Mean	p
Gender (n)	252		2175			208		2518		
Male, %	52.4		57.7			53.4		58.2		
Female, %	47.6		42.3		0.107	46.6		41.8		0.189
Age in years (n)	252		2177			208		2516		
15-19, %	25.4		20.2			12.0		14.4		
20-24, %	70.6	21.0	58.4	22.4	< 0.001	83.2	21.7	66.4	22.6	< 0.001
25-29, %	3.2		14.3			3.8		12.6		
More than 30, %	7.1		7.1			1.0		6.6		
Marital status (n)	252		2177			209		2516		
Single, %	98.8		90.3		0.001	98.1		92.1		0.001
Married, %	1.2		9.7			1.9		7.9		
Family income (n)	235		2074			195		2410		
0-10× MW, %	6.0		16.0			10.3		21.2		
11-20× MW, %	17.5		24.7			16.4		26.3		
21-30× MW, %	20.8	31.2	19.6	25.7	0.001	20.5	30.4	24.1	22.6	0.001
31-40× MW, %	20.4		15.4			14.9		12.4		
More than 40× MW, %	35.3		24.3			37.9		16.0		

in 2001 (30.6% *vs.* 17.5%; p = 0.036). In 1996, lifetime use of inhalants was significantly higher among men (25.8% *vs.* 10.8%, p = 0.003), as was previous 12 months use of inhalants (21.1% *vs.* 7.5%, p = 0.002), but this gender-related difference did not reach statistical significance in 2001.

There was also a gender-related effect regarding alcohol use in the previous 30 days, although this difference was significant only in 1996 (81.8% in men vs. 70.0% in women; p = 0.038). No other gender-related differences were observed.

Alcohol, tobacco, marijuana and inhalants were the four drugs most consumed, by both genders and in both surveys. In 1996, cocaine and hallucinogens were the fifth and sixth most commonly used drugs among men (for lifetime, previous 12 months and previous 30 days use), but this pattern of use changed in 2001, when cocaine was replaced by amphetamines (in fifth place) and hallucinogens maintained the sixth position. Surprisingly, there was no change in the drug use profile among women from one survey to the other, with the fifth and sixth positions still occupied by amphetamines and tranquilizers. It is noteworthy that, in 2001, hallucinogens took an important place in the history of drug consumption among women, as the seventh most commonly consumed drug, just below tranquilizers.

4. Academic year-related effects on drug consumption

Table 6 shows the consumption of alcohol, tobacco and other drugs among medical students at FMUSP, by academic year.

In 2001, illicit drug use in the previous 12 months was higher among the medical students in the early-years group than among those in the later-years group (39.3% *vs.* 25.7%; p = 0.05). Also in 2001, there were intergroup differences in inhalant use, in the previous 12 months (early-years: 29.6%; later-years: 14.9%; p = 0.027) and in the previous 30 days (early-years: 18.5%; later-years: 6.8%; p = 0.023). This suggests that inhalant consumption was more prevalent among early-year medical students. In 2001, the prevalence of lifetime tobacco use was statistically higher among the medical students in the early-years group than among those in the later-years group (51.1% *vs.* 35.1%; p = 0.030). However, a different pattern of use was identified for anticholinergics and ecstasy. In 1996, lifetime use of

anticholinergics was marginally higher among the students in the later-years group (3.1% *vs.* 0.0%; p = 0.058), although this difference was no longer statistically significant in 2001. Finally, concerning lifetime use of ecstasy in 2001, it was also higher among medical students in the later academic years (early-years: 0.0%; later-years: 6.8%; p = 0.005).

5. Comparison between FMUSP students and other USP students

Table 7 shows the comparison between FMUSP students and other USP students in terms of the consumption of alcohol, tobacco and other drugs.[10,11]

In 1996, there were very few differences between medical students and other undergraduates. Anticholinergic and inhalant use in the previous 12 months was higher among medical students (p < 0.01). Crack cocaine and inhalant use in the previous 30 days was also higher among medical students (p < 0.001).

In 2001, these differences were extended to other drugs. Inhalant use (lifetime, previous 12 months and previous 30 days) was higher among medical students (p < 0.01). Alcohol use in the previous 12 months and previous 30 days, as well as crack cocaine use in the previous 30 days, was also higher among medical students (p < 0.05). Finally, opiate use in the previous 12 months was slightly higher among medical students, a difference that was marginally significant (p = 0.055).

Certain drugs were more commonly consumed by non-medical students, especially in the second survey (2001). Lifetime use of marijuana, hallucinogens and cocaine was higher among such students (p < 0.05). The same was true for tobacco and marijuana use in the previous 12 months (p < 0.05). Finally, the use of tobacco and marijuana in the previous 30 days was higher among non-medical students (p < 0.01).

Discussion
1. Drug use at FMUSP

Alcohol, tobacco and illicit drug use among FMUSP medical students was similar to that reported in other studies conducted in Brazil.[15,17,43-45] Among the FMUSP students, there was an increase in

Table 4 - Consumption of alcohol, tobacco and other drugs among medical students, by survey year

Psychotropic substance	Usage measurement	1996		2001		
		%	95% CI	%	95% CI	p*
Alcohol	Lifetime, %	92.9	90.0-95.8	94.8	92.0-97.6	0.446
	Previous 12 months, %	84.6	80.5-88.6	85.7	81.3-90.1	0.794
	Previous 30 days, %	76.3	71.5-81.0	75.7	70.3-81.1	0.913
Tobacco	Lifetime, %	39.9	34.4-45.4	45.2	39.0-51.5	0.258
	Previous 12 months, %	21.7	17.1-26.4	19.5	14.6-24.5	0.567
	Previous 30 days, %	17.8	13.5-22.1	15.2	10.7-19.7	0.531
Marijuana	Lifetime, %	27.3	22.3-32.3	24.3	18.9-29.7	0.523
	Previous 12 months, %	20.2	15.7-24.7	14.3	9.9-18.7	0.111
	Previous 30 days, %	13.8	10.0-17.7	10.5	6.6-14.3	0.321
Hallucinogens	Lifetime, %	4.0	1.8-6.1	6.7	3.5-9.8	0.211
	Previous 12 months, %	2.4	0.7-4.1	4.8	2.1-7.4	0.203
	Previous 30 days, %	2.0	0.4-3.5	2.9 (209)**	0.8-5.0	0.555
Cocaine	Lifetime, %	4.4	2.1-6.6	1.9	0.2-3.6	0.189
	Previous 12 months, %	2.4	0.7-4.1	1.0	0.0-2.2	0.302
	Previous 30 days, %	1.6	0.2-3.0	0.5	0.0-1.3	0.383
Crack cocaine	Lifetime, %	0.8	0.0-1.8	0.5	0.0-1.3	> 0.999
	Previous 12 months, %	0.8	0.0-1.8	0.5	0.0-1.3	> 0.999
	Previous 30 days, %	0.8	0.0-1.8	0.5	0.0-1.3	> 0.999
Amphetamines	Lifetime, %	4.4	2.1-6.6	9.5	5.8-13.2	0.038
	Previous 12 months, %	3.2	1.2-5.1	7.6	4.3-10.9	0.036
	Previous 30 days, %	3.2	1.2-5.1	5.2	2.4-8.0	0.347
Anti-cholinergics	Lifetime, %	1.2 (252)**	0.0-2.4	1.0	0.0-2.2	> 0.999
	Previous 12 months, %	1.2	0.0-2.4	0.0	#	0.255
	Previous 30 days, %	0.4	0.0-1.1	0.0	#	> 0.999
Inhalants	Lifetime, %	19.0	14.6-23.4	32.9	27.0-38.7	0.001
	Previous 12 months, %	15.0	11.0-19.0	24.3	18.9-29.7	0.013
	Previous 30 days, %	8.7	5.5-11.9	14.3	9.9-18.7	0.075
Tranquilizers	Lifetime, %	5.9	30.-8.6	6.7	3.5-9.8	0.848
	Previous 12 months, %	3.6	1.5-5.6	4.3	1.8-6.8	0.81
	Previous 30 days, %	2.4	0.7-4.1	2.9	0.8-4.9	0.776
Opiates	Lifetime, %	0.8	0.0-1.8	1.9	0.2-3.6	0.417
	Previous 12 months, %	0.4	0.0-1.1	1.4	0.0-2.9	0.334
	Previous 30 days, %	0.4	0.0-1.1	1.0	0.0-2.2	0.593
Sedatives	Lifetime, %	0.0	-	1.0	0.0-2.2	0.205
	Previous 12 months, %	0.0	-	1.0	0.0-2.2	0.205
	Previous 30 days, %	0.0	-	1.0	0.0-2.2	0.205
Steroids	Lifetime, %	0.4 (252)**	0.0-1.1	0.0	-	> 0.999
	Previous 12 months, %	0.4	0.0-1.1	0.0	-	> 0.999
	Previous 30 days, %	0.0	-	0.0	-	-
Ecstasy	Lifetime, %	-	-	2.4	0.5-4.3	-
	Previous 12 months, %	-	-	1.0	0.0-2.2	-
	Previous 30 days, %	-	-	0.0	-	-
Illicit drugs	Lifetime, %	36.7 (251)**	31.2-42.1	45.2	39.0-51.5	0.07
	Previous 12 months, %	30.0	24.9-35.2	34.3	28.3-40.2	0.368
	Previous 30 days, %	21.7	17.1-26-4	23.9 (209)**	18.6-29.3	0.579
	N	253		210		

* p < 0.05

** The sample size for this variable was less than the total size of the sample.

recreational illicit drug use and in the use of nonprescription drugs. In addition, there was a marked change in the drug use profile among medical students. Inhalant use rose to reach the position of second most consumed drug, overtaking marijuana and even tobacco consumption. According to Lemos et al., who studied drug use patterns among students at two medical schools in Salvador,

Brazil, this is a relevant outcome, indicating a major change in drug consumption among medical students.[17] In the first FMUSP survey and in other Brazilian surveys, inhalants were the fourth most commonly consumed drugs among medical students.[18-19,39,45]

Marked differences can be seen when comparing the results of the current study with those of nationwide surveys. When compared

Table 5 - Consumption of alcohol, tobacco and other drugs among medical students, by gender and survey year

Psychotropic substance	Usage measurement	1996			2001		
		Men	Women	p*	Men	Women	p*
Alcohol	Lifetime, %	94.7 (90.9-98.5)	90.8 (85.7-96.0)	0.328	96.4 (92.9-99.9)	92.8 (87.6-97.9)	0.353
	Previous 12 months, %	87.9 (82.3-93.5)	80.8 (73.8-87.9)	0.163	86.5 (80.1-92.8)	84.5 (77.3-91.7)	0.698
	Previous 30 days, %	81.8 (75.2-88.4)	70.0 (61.8-78.2)	0.038	78.4 (70.7-86.0)	72.2 (63.2-81.1)	0.334
Tobacco	Lifetime, %	40.2 (31.8-48.5)	39.2 (30.4-47.9)	0.898	46.8 (37.6-56.1)	44.3 (34.4-54.2)	0.781
	Previous 12 months, %	19.7 (12.9-26.5)	23.3 (15.8-30.9)	0.54	21.6 (14.0-29.3)	17.5 (10.0-25.1)	0.489
	Previous 30 days, %	15.9 (9.7-22.2)	19.2 (12.1-26.2)	0.511	17.1 (10.1-24.1)	13.4 (6.6-20.2)	0.564
Marijuana	Lifetime, %	32.6 (24.6-40.6)	20.8 (13.6-28.1)	0.046	30.6 (22.1-39.2)	17.5 (10.0-25.1)	0.036
	Previous 12 months, %	22.7 (15.6-29.9)	16.7 (10.01-23.3)	0.269	16.2 (9.4-23.1)	12.4 (5.8-18.9)	0.553
	Previous 30 days, %	14.4 (8.4-20.4)	12.5 (6.6-18.4)	0.714	12.6 (6.4-18.8)	8.3 (2.8-13.7)	0.37
Hallucinogens	Lifetime, %	6.1 (2.0-10.1)	1.7 (0.0-4.0)	0.106	8.1 (3.0-13.2)	5.2 (0.8-9.5)	0.423
	Previous 12 months, %	3.8 (0.5-7.1)	0.8 (0.0-2.5)	0.216	6.3 (1.8-10.8)	3.1 (0.0-6.5)	0.343
	Previous 30 days, %	3.8 (0.5-7.1)	0.0	0.061	3.6 (0.1-7.1) (110)**	2.1 (0.0-4.9)	0.687
Cocaine	Lifetime, %	6.8 (2.5-11.1)	1.7 (0.0-4.0)	0.063	2.7 (0.0-5.7)	1 (0.0-3.0)	0.625
	Previous 12 months, %	3.8 (0.5-7.1)	0.8 (0.0-2.5)	0.216	0.9 (0.0-2.7)	1 (0.0-3.0)	> 0.999
	Previous 30 days, %	2.3 (0.0-4.8)	0.8 (0.0-2.5)	0.624	0.9 (0.0-2.7)	0.0	> 0.999
Crack cocaine	Lifetime, %	1.5 (0.0-3.6)	0.0	0.499	0.9 (0.0-2.7)	0.0	> 0.999
	Previous 12 months, %	1.5 (0.0-3.6)	0.0	0.499	0.9 (0.0-2.7)	0.0	> 0.999
	Previous 30 days, %	1.5 (0.0-3.6)	0.0	0.499	0.9 (0.0-2.7)	0.0	> 0.999
Amphetamines	Lifetime, %	2.3 (00.0-4.8)	6.7 (2.2-1.1)	0.123	9.9 (4.4-15.5)	9.3 (3.5-15.1)	> 0.999
	Previous 12 months, %	1.5 (0.0-3.6)	5.0 (1.1-8.9)	0.156	8.1 (3.0-13.2)	7.2 (2.1-12.4)	> 0.999
	Previous 30 days, %	1.5 (0.0-3.6)	5.0 (1.1-8.9)	0.156	5.4 (1.2-9.6)	5.2 (0.8-9.5)	> 0.999
Anti-cholinergics	Lifetime, %	2.3 (0.0-4.8) (131)**	0.0	0.248	0.0	2.1 (0.0-4.9)	0.216
	Previous 12 months, %	2.3 (0.0-2.2)	0.0	0.249	0.0	0.0	-
	Previous 30 days, %	11.4 (6.0-16.8)	0.0	> 0.999	0.0	0.0	-
Inhalants	Lifetime, %	25.8 (18.3-33.2)	10.8 (5.3-16.4)	0.003	38.7 (29.7-47.8)	26.8 (18.0-35.6)	0.77
	Previous 12 months, %	21.1 (14.2-28.2)	7.5 (2.8-12.2)	0.002	29.7 (21.2-38.2)	18.6 (10.8-26.3)	0.076
	Previous 30 days, %	11.4 (6.0-16.8)	5.8 (1.6-10.0)	0.179	18.0 (10.9-25.2)	10.3 (4.3-16.4)	0.165
Tranquilizers	Lifetime, %	5.3 (1.5-9.1)	6.7 (2.2-11.1)	0.791	5.4 (1.2-9.6)	8.3 (2.8-13.7)	0.581
	Previous 12 months, %	3.0 (0.1-6.0)	4.2 (0.6-7.7)	.074	4.5 (0.6-8.4)	4.1 (0.2-8.1)	> 0.999
	Previous 30 days, %	1.5 (0.0-3.6)	3.3 (0.1-6.5)	0.428	1.8 (0.0-4.3)	4.1 (0.2-8.1)	0.421
Opiates	Lifetime, %	0.8 (0.0-2.2)	0.8 (0.0-2.5)	> 0.999	1.8 (0.0-4.3)	2.1 (0.0-4.9)	> 0.999
	Previous 12 months, %	0.0	0.8 (0.0-2.5)	0.476	1.8 (0.0-4.3)	1 (0.0-3.0)	> 0.999
	Previous 30 days, %	0.0	0.8 (0.0-2.5)	0.476	1.8 (0.0-4.3)	0.0	0.5
Sedatives	Lifetime, %	0.0	0.0	-	0.9 (0.0-2.7)	1 (0.0-3.0)	> 0.999
	Previous 12 months, %	0.0	0.0	-	0.9 (0.0-2.7)	1 (0.0-3.0)	> 0.999
	Previous 30 days, %	0.0	0.0	-	0.9 (0.0-2.7)	1 (0.0-3.0)	> 0.999
Steroids	Lifetime, %	0.8 (0.0-2.2)	0.0 (119)**	> 0.999	0.0	0.0	-
	Previous 12 months, %	0.8 (0.0-2.2)	0.0	> 0.999	0.0	0.0	-
	Previous 30 days, %	0.0	0.0	-	0.0	0.0	-
Ecstasy	Lifetime, %	-	-	-	3.6 (0.1-1.7)	1 (0.0-3.0)	0.375
	Previous 12 months, %	-	-	-	1.8 (0.0-4.3)	0.0	0.5
	Previous 30 days, %	-	-	-	0.0	0.0	-
Illicit drugs	Lifetime, %	41.2 (32.8-49.7) (131)**	31.1 (22.8-39.4) (119)**	0.114	47.8 (38.5-57.0)	43.3 (33.4-53.2)	0.578
	Previous 12 months, %	34.1 (26.0-42.2)	25.0 (17.3-32.7)	0.13	36.9 (28.0-45.9)	32.0 (22.7-41.2)	0.469
	Previous 30 days, %	22.0 (14.9-29.0)	20.8 (13.6-28.1)	0.878	24.6 (16.5-32.6) (110)**	23.7 (15.2-32.2)	> 0.999
	N	132	120		111	97	

* p < 0.05
Data expressed as mean (95% CI) and, in some cases, (n).

** The sample size for this variable was less than the total size of the sample.

Table 6 - Consumption of alcohol, tobacco and other drugs among medical students, by academic year group and by survey year

Psychotropic substance	Measurement	1996			2001		
		Early-years	Later-years	p*	Early-years	Later-years	p*
Alcohol	1. Lifetime use	95.4 (92.1-98.7)	88.9 (82.7-95.1)	0.077	96.6 (93.5-99.6)	93.2 (87.5-99.0)	0.525
	2. Previous 12 months	86.9 (81.6-92.3)	80.8 (73.1-88.6)	0.214	85.9 (80.1-91.8)	85.1 (77.0-93.2)	> 0.999
	3. Previous 30 days	79.7 (73.4-86.1)	70.7 (61.7-79.7)	0.13	74.1 (66.7-81.5)	78.4 (69.0-87.8)	0.614
Tobacco	1. Lifetime use	40.5 (32.7-48.3)	38.4 (28.8-48.0)	0.793	51.1 (42.7-59.5)	35.1 (24.3-46.0)	0.03
	2. Previous 12 months	22.9 (16.2-29.5)	19.2 (11.4-26.9)	0.532	20.7 (13.9-27.6)	17.6 (8.9-26.2)	0.716
	3. Previous 30 days	17.7 (11.6-23.7)	17.2 (9.7-24.6)	> 0.999	15.6 (9.4-21.7)	14.9 (6.8-23.0)	> 0.999
Marijuana	1. Lifetime use	28.1 (21.01-35.2)	25.3 (16.7-33.8)	0.665	23.7 (16.5-30.9)	25.7 (15.7-35.6)	0.74
	2. Previous 12 months	20.9 (14.5-27.4)	18.2 (10.6-25.8)	0.631	14.8 (8.8-20.8)	13.5 (5.7-21.3)	0.84
	3. Previous 30 days	14.4 (8.8-19.9)	12.1 (5.7-18.5)	0.707	10.4 (5.2-15.5)	10.8 (3.7-17.9)	> 0.999
Hallucinogens	1. Lifetime use	2.6 (0.1-5.1)	6.1 (1.4-10.8)	0.197	5.2 (1.4-8.9)	9.5 (2.8-16.1)	0.257
	2. Previous 12 months	2.0 (0.0-4.2)	3.0 (0.0-6.4)	0.682	3.7 (0.5-6.9)	6.8 (1.0-12.5)	0.33
	3. Previous 30 days	1.3 (0.0-3.1)	3.0 (0.0-6.4)	0.384	2.2 (0.0-4.7)	4.1 (0.0-8.7) (73)**	0.425
Cocaine	1. Lifetime use	3.9 (0.8-7.0)	5.1 (0.7-9.4)	0.756	1.5 (0.0-3.5)	2.7 (0.0-6.4)	0.616
	2. Previous 12 months	2.0 (0.0-4.2)	3.0 (0.0-6.4)	0.682	0.7 (0.0-2.2)	1.4 (0.0-4.0)	> 0.999
	3. Previous 30 days	1.3 (0.0-3.1)	2.0 (0.0-4.8)	0.647	0.7 (0.0-2.2)	0.0	> 0.999
Crack cocaine	1. Lifetime use	0.0	2.0 (0.0-4.8)	0.153	0.7 (0.0-2.2)	0.0	> 0.999
	2. Previous 12 months	0.0	2.0 (0.0-4.8)	0.153	0.7 (0.0-2.2)	0.0	> 0.999
	3. Previous 30 days	0.0	2.0 (0.0-4.8)	0.153	0.7 (0.0-2.2)	0.0	> 0.999
Amphetamines	1. Lifetime use	2.6 (0.1-5.1)	7.1 (2.0-12.1)	0.117	9.6 (4.7-14.6)	9.5 (2.8-16.1)	> 0.999
	2. Previous 12 months	2.0 (0.0-4.2)	5.1 (0.7-9.4)	0.269	8.2 (3.5-12.8)	6.8 (1.0-12.5)	0.792
	3. Previous 30 days	2.0 (0.0-4.2)	5.1 (0.7-9.4)	0.269	5.9 (1.9-9.9)	4.1 (0.0-8.5)	0.75
Anti-cholinergics	1. Lifetime use	0.0	3.1 (0.0-6.5) (98)**	0.058	0.7 (0.0-2.2)	1.4 (0.0-4.0)	> 0.999
	2. Previous 12 months	0.0	3.0 (0.0-6.4)	0.059	0.0	0.0	#
	3. Previous 30 days	0.0	1.0 (0.0-3.0)	0.393	0.0	0.0	#
Inhalants	1. Lifetime use	20.3 (13.9-26.6)	16.2 (8.9-23.4)	0.508	36.3 (28.2-44.4)	27.0 (16.9-37.1)	0.219
	2. Previous 12 months	16.3 (10.5-22.2)	12.1 (5.7-18.5)	0.466	29.6 (21.9-37.3)	14.9 (6.8-23.0)	0.019
	3. Previous 30 days	11.1 (6.1-16.1)	5.1 (0.7-9.4)	0.113	18.5 (12.1-25.1)	6.8 (1.0-12.5)	0.023
Tranquilizers	1. Lifetime use	3.9 (0.8-7.0)	9.1 (3.4-14.8)	0.106	5.9 (1.9-9.9)	8.1 (1.9-14.3)	0.571
	2. Previous 12 months	2.6 (0.1-5.1)	5.1 (0.7-9.4)	0.321	3.0 (0.1-5.8)	6.8 (1.0-12.5)	0.285
	3. Previous 30 days	2.0 (0.0-4.2)	3.0 (0.0-6.4)	0.682	3.0 (0.1-5.8)	2.7 (0.0-6.4)	> 0.999
Opiates	1. Lifetime use	0.0	2.0 (0.0-4.8)	0.153	1.5 (0.0-3.5)	2.7 (0.0-6.4)	0.616
	2. Previous 12 months	0.0	1.0 (0.0-3.0)	0.393	0.7 (0.0-2.2)	2.7 (0.0-6.4)	0.286
	3. Previous 30 days	0.0	1.0 (0.0-3.0)	0.393	0.0	2.7 (0.0-6.4)	0.124
Sedatives	1. Lifetime use	0.0	0.0	#	0.7 (0.0-2.2)	1.4 (0.0-4.0)	> 0.999
	2. Previous 12 months	0.0	0.0	#	0.7 (0.0-2.2)	1.4 (0.0-4.0)	> 0.999
	3. Previous 30 days	0.0	0.0	#	0.7 (0.0-2.2)	1.4 (0.0-4.0)	> 0.999
Steroids	1. Lifetime use	0.0	1.0 (0.0-3.0) (98)**	0.39	0.0	0.0	#
	2. Previous 12 months	0.0	1.0 (0.0-3.0)	0.393	0.0	0.0	#
	3. Previous 30 days	0.0	0.0	#	0.0	0.0	#
Illicit drugs	1. Lifetime use	#	#	#	0.0	6.8 (1.0-12.5)	0.005
	2. Previous 12 months	#	#	#	0.0	2.7 (0.0-6.4)	0.124
	3. Previous 30 days	#	#	#	0.0	0.0	#
Ecstasy	1. Lifetime use	36.0 (28.3-43.6)	37.1 (27.5-46.7) (97)**	0.893	48.9 (40.5-57.3)	39.2 (28.1-50.3)	0.194
	2. Previous 12 months	28.8 (21.6-35-9)	31.3 (22.2-40.4)	0.675	39.3 (31.0-47.5)	25.7 (15.7-35.6)	0.05
	3. Previous 30 days	21.6 (15.1-28.1)	21.2 (13.2-29.3)	> 0.999	27.4 (19.9-34.9)	17.8 (9.0-26.6) (73)**	0.13
	N	153	99		135	74	

* p < 0.05
** The sample size for this variable was less than the total size of the sample.
Data expressed as mean (95% CI) and, in some cases, (n)
Early-years: first to third academic years group; Later-years: fourth to sixth academic years group; MW: minimum wage

with young adults in the same age range (18-24 years) in the general population (reference year: 2001),[12] the difference regarding the prevalences of lifetime use of illicit drugs (general), alcohol, tobacco, inhalants, amphetamines, hallucinogens and tranquilizers is notable. Nevertheless, regardless of how remarkable the differences in alcohol and tobacco use are, it can be seen that (overall) illicit drug use was 2.3 times higher among medical students than among young adults in the general population (45.2% vs. 19.4%). Even greater differences can be seen regarding the use of inhalants, amphetamines and hallucinogens. For instance, hallucinogen use was almost 10 times greater among medical students than in the general population (6.7% vs. 0.7%).[12]

Even after a four-year interval (from 2001 to 2005), the level of drug use reported for young adults aged 18 to 24 years in the general population was lower than that observed among medical students, for overall illicit drug use and for the specific use of inhalants, amphetamines and hallucinogens.[12,49] Drug consumption among medical students was also higher than that observed for middle school and high school students in private and public schools[50] (it should be borne in mind that, in the present study, we did not carry out statistical procedures to analyze these drug prevalence differences in detail. Therefore, the comparisons suggested here are only exploratory).

The increase in illicit drug use among medical students (although not statistically significant) was paralleled by an increase among other students at USP, over the same time period.[10,11] However, inhalant consumption merits the greatest attention. Although there was a significant increase in inhalant use among other undergraduates at USP,[11] the increase was significantly greater among medical students. This corroborates the findings of other Brazilian studies[15-19,40,45] and suggests that, despite some regional differences, inhalant consumption is usual among medical students.

2. Drug use: academic year-related effects

The use of illicit drugs (especially inhalants) was more prevalent among students in the early academic years, whereas recreational use of anticholinergics and ecstasy was more common among students in the later academic years.

Taken together, the data indicate a major change in the drug use situation at FMUSP, 10 years after the first survey was conducted (1991-1993). At the time of the first survey, the use of alcohol, tobacco, drugs (marijuana and inhalants) and tranquilizers was greater among students in the later academic years (third to sixth years).[39] This fluctuation in drug consumption by academic year and by gender has previously been evaluated.[17,19,39,43] Da Silveira et al.[19] showed that inhalant use was greater during the first three academic years, reaching a prevalence of 40% among second-year students. Paduani et al.[43] found that alcohol consumption increased as the medical course progressed, and Lemos et al.[17] extended this finding to inhalant and tranquilizer use. However, neither these previous studies nor the present study was longitudinal, and it therefore cannot be assumed that the observed increase occurred over the course of the medical training. Hence, the findings that have been reported are still under debate.

One hypothesis to explain the higher illicit drug use in the early academic years is that basic-cycle medical students, especially those living away from home, usually present higher levels of clinical stress symptoms, particularly when trying to manage their lifestyle (academic stress). Thus, trying drugs and using them on a regular basis might be understood as a way of alleviating psychological stress among students in the early academic years.[21] Perhaps

for this reason, other studies have demonstrated that university students who still live with their parents and those whose parents live together harmoniously usually present the lowest levels of illicit drug use.[18,19] In general, interventions aimed at preventing the negative consequences of academic stress among medical students and improving their lifestyle/well-being (through promoting individual and social skills) might effectively change their drug consumption patterns.[21]

Although drug use is more prevalent among medical students in the early academic years, the risk factors for drug use among students in the later years should not be disregarded. As identified in previous studies, drug use among students in the later academic years is especially due to the ease of access to drugs and contact with other professionals who are already recreational users. In addition, drug use is seen as a way to achieve better academic and work performance, a common motivation for drug use among health professionals.[14,22,39,51] These factors need to be taken in account as a whole when planning intervention strategies aimed at controlling drug use among such student populations. It is also of note that, in trying to alleviate psychological and physical stress, along with work overload, medical students and physicians have practiced self-medication. This leads to significant health impairment[24,47] and delays the recognition and treatment of drug abuse or dependence, thereby affecting their professional lives and consequently the well-being of their patients.[46,47] Finally, since medical students and physicians play a pivotal role in helping to reduce the burden of disease relating to substance use disorders,[52] they should become better educated about this issue, thus protecting themselves from such disorders.

3. Drug use: gender-related effects

Contrary to what has been observed in the state of São Paulo as a whole[53,54] and in the general population of Brazil,[49,55-57] there has been gender convergence among FMUSP students in terms of the use of alcohol, tobacco and illicit drugs. Such convergence, especially regarding alcohol consumption, has also been identified in international studies.[58,59] In the present study, marijuana and inhalant use continued to be more common among men, thus corroborating the findings of other studies involving the same target population,[15-19] although other differences in use, previously attributed to gender, were no longer detected. Amphetamine and tranquilizer consumption, previously exclusive to females, also became prevalent among men, a result that differs slightly from those of other studies.[13,15-17,19,31,60] Among men, amphetamine use replaced cocaine among the drugs most commonly consumed, whereas special attention should be given to hallucinogen use among women.

4. Inhalant use

Among FMUSP students, inhalant consumption has risen, ranking second and third in terms of prevalence of use (lifetime and previous 12 months) in 2001, thus surpassing tobacco and marijuana consumption. Inhalant use was more common among medical students than among other students at USP,[10,11] among young adults in the same age range in the general population[12,49] or among middle school/high school students.[59] At other universities, inhalant use has also been found to be more prevalent among medical students, which would characterize this as a common behavioral pattern among such university students.[16,17,19,40,45] In addition, inhalant use has been found to be more prevalent among males (in studies of general populations).[12,49] This suggests that male gender is a

Table 7 - Consumption of alcohol, tobacco and other drugs among medical students and other university students, by survey year

Psychotropic substance	Measurement	1996			2001		
		Non-medical	Medical	p*	Non-medical	Medical	p*
Alcohol	1. Lifetime use	91.3	92.9	0.373	92.0	94.8	0.138
	2. Previous 12 months	82.4	84.6	0.354	80.0	85.7	0.042
	3. Previous 30 days	72.7	76.3	0.198	69.0 (2523)**	75.7	0.032
Tobacco	1. Lifetime use	44.7	39.9	0.124	51.2 (2523)**	45.2	0.077
	2. Previous 12 months	25.6	21.7	0.160	27.0	19.5	0.012
	3. Previous 30 days	21.5	17.8	0.148	22.6	15.2	0.009
Marijuana	1. Lifetime use	31.8	27.3	0.120	35.9	24.3	< 0.001
	2. Previous 12 months	20.4	20.2	0.939	23.2	14.3	0.002
	3. Previous 30 days	15.1	13.8	0.560	17.2	10.5	0.008
Hallucinogens	1. Lifetime use	6.2	4.0	0.143	11.6	6.7	0.023
	2. Previous 12 months	3.4	2.4	0.366	5.0	4.8	0.866
	3. Previous 30 days	1.6	2.0	0.648	2.4	2.9 (209)**	0.639
Cocaine	1. Lifetime use	7.0	4.4	0.094	6.7	1.9	0.005
	2. Previous 12 months	3.5	2.4	0.314	3.0	1.0	0.074
	3. Previous 30 days	2.0	1.6	0.619	1.5	0.5	0.203
Crack cocaine	1. Lifetime use	0.8	0.8	0.965	1.0	0.5	0.415
	2. Previous 12 months	0.3	0.8	0.176	0.2	0.5	0.217
	3. Previous 30 days	0.1	0.8	< 0.001	0.1	0.5	< 0.001
Amphetamines	1. Lifetime use	4.6 (2185)**	4.4	0.866	9.4	9.5	0.967
	2. Previous 12 months	2.4	3.2	0.428	5.3	7.6	0.131
	3. Previous 30 days	1.8	3.2	0.101	3.5	5.2	0.150
Anti-cholinergics	1. Lifetime use	0.9 (2182)**	1.2 (252)**	0.643	3.2	1.0	0.060
	2. Previous 12 months	0.3 (2185)**	1.2	0.004	0.8	0.0	0.194
	3. Previous 30 days	0.2 (2185)**	0.4	0.397	0.4	0.0	0.366
Inhalants	1. Lifetime use	18.3 (2184)**	19.0	0.767	24.3	32.9	0.003
	2. Previous 12 months	8.8 (2185)**	15.0	< 0.001	13.0	24.3	< 0.001
	3. Previous 30 days	3.7 (2185)**	8.7	< 0.001	6.2 (2523)**	14.3	< 0.001
Tranquilizers	1. Lifetime use	5.7 (2184)**	5.9	0.867	7.4	6.7	0.677
	2. Previous 12 months	3.2 (2185)**	3.6	0.734	4.0	4.3	0.804
	3. Previous 30 days	2.3 (2185)**	2.4	0.946	2.4	2.9	0.690
Opiates	1. Lifetime use	0.7 (2185)**	0.8	0.941	1.3	1.9	0.476
	2. Previous 12 months	0.3	0.4	0.672	0.5	1.4	0.055
	3. Previous 30 days	0.2	0.4	0.390	0.3	1.0	0.130
Sedatives	1. Lifetime use	0.9 (2185)**	0.0	0.131	2.0	1.0	0.281
	2. Previous 12 months	0.3	0.0	0.348	0.9	1.0	0.919
	3. Previous 30 days	0.2	0.0	0.434	0.6	1.0	0.569
Steroids	1. Lifetime use	0.4 (2185)**	0.4 (252)**	0.991	0.5	0.0	0.276
	2. Previous 12 months	0.1	0.4	0.202	0.4	0.0	0.366
	3. Previous 30 days	0.1	0.0	0.649	0.2	0.0	0.467
Illicit drugs	1. Lifetime use	39.6 (2179)**	36.7 (251)**	0.338	45.7	45.2	0.889
	2. Previous 12 months	26.4 (2185)**	30.0	0.182	31.7	34.3	0.406
	3. Previous 30 days	19.0 (2185)**	21.7	0.266	23.2 (2523)**	23.9 (209)**	0.797
Ecstasy	1. Lifetime use				3.8	2.4	0.249
	2. Previous 12 months				2.0	1.0	0.242
	3. Previous 30 days				1.1	0.0	0.106
	N	2186	253		2524	210	

* p < 0.05
** The sample size for this variable was less than the total size of the sample.
Data expressed as % or as % (n)
Further details about drug consumption at USP are found in references 8 and 9.

relevant risk factor for inhalant consumption.[15-17] Such consumption is also more common among students in the early academic years, although there is still some debate about this.[14,15,17,19]

Since medical students in Brazil generally come from high-income families[15] and still live with their parents,[16] inhalant use among such students depicts a paradoxical situation, considering that solvent inhalation is one of the most peculiar behavioral patterns among children and adolescents living on the streets[61] and among adolescents in juvenile detention centers.[62] It is surprising that the same substances are consumed by such different social strata, even if used only in celebratory situations, as commonly reported by medical students.[63] In addition, since repeated solvent inhalation favors the onset of comorbidities such as antisocial attitudes, mental illnesses and cognitive deficits,[62] it is worrisome that this occurs among future doctors. Solvent inhalation also has a negative influence on preexisting psychiatric illnesses. Overall, inhalant use might have a negative impact on academic performance and on the quality of the future health professional, jeopardizing their lives and the lives of their patients.

Conclusion

Although the findings of the present study must still be regarded as preliminary, they indicate that, over a five-year period (from comparison between two independent cross-sectional studies conducted in 1996 and 2001), there was an increase in drug use among medical students at FMUSP. The effects that gender and academic year have on drug consumption must be considered in planning interventions aimed at influencing the behavior of medical students. Since drug use among medical students has increased despite the information to which they have access, the data suggest that there is a need allocate resources for the treatment, recovery and rehabilitation of students who already abuse or are dependent on drugs. In addition, there need to be strategies aiming toward early recognition of such individuals, in order to avoid the onset or progression of drug use-related implications. Furthermore, inhalant use merits special attention, and further studies should investigate this. Finally, additional studies are needed in order to increase understanding of the reasons for drug use among medical students, focusing also on the dimension that inhalant use has acquired among them and its implications for the university environment.

1. Study limitations

The present study had certain limitations. Students who were absent when the questionnaire was applied were not contacted again, and, therefore, nothing could be concluded about their behavior. It is possible that their absence could be explained by situations in which drug use/abuse was already present. It could be argued that, had they answered the questionnaire, the prevalence of drug use would have been greater than what was determined. Since these surveys are cross-sectional studies, conclusions relating to the influence that academic year has on drug use among medical students cannot be precisely defined.

Disclosures

Writting group member	Employment	Research grant[1]	Other research grant or medical continuous education[2]	Speaker's honoraria	Ownership interest	Consultant/ Advisory board	Other[3]
Lucio Garcia de Oliveira	FMUSP	-	-	-	-	-	-
Lucia Pereira Barroso	IME-USP	-	-	-	-	-	-
Gabriela Arantes Wagner	FMUSP	-	-	-	-	-	-
Julio de Carvalho Ponce	FMUSP						
André Malbergier	GREA/FMUSP						
Vladimir de Andrade Stempliuk	SENAD						
Arthur Guerra de Andrade	GREA/FMUSP FMABC	-	-	-	-	-	-

* Modest
** Significant
*** Significant. Amounts given to the author's institution or to a colleague for research in which the author has participation, not directly to the author.
Note: FMUSP = Universidade de São Paulo School of Medicine; IME-USP = Institute of Mathematics and Statistics of the Universidade de São Paulo; GREA = Interdisciplinary Research Group for Alcohol and Drugs Studies; SENAD = Secretaria Nacional Antidrogas; FMABC = Faculdade de Medicina do ABC.
For more information, see Instructions for authors.

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