

Comparative study of drug use among undergraduate students at the University of São Paulo – São Paulo campus in 1996 and 2001

Estudo comparativo entre 1996 e 2001 do uso de drogas por alunos da graduação da Universidade de São Paulo - Campus São Paulo

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Abstract

Objective: To compare the rate of drug use prevalence and to investigate opinions regarding such use among undergraduate students at the University of São Paulo – São Paulo campus in 1996 and again in 2001. **Methods:** Both studies followed the same procedures of sampling and data collection. A random sample of undergraduate students, divided into the areas Humanities, Exact Sciences and Biologic Sciences, responded to an anonymous and self-report survey regarding the use of licit and illicit drugs within the last 30 days, within the last 12 months and over the lifetime of the subject. The two surveys were compared through the construction of (95%) confidence intervals for the prevalence differences for each substance by area and by total number of students. The Wald test for homogeneity was applied in order to compare the prevalences. **Results:** High approval of regularly trying and using cocaine, crack, amphetamines and inhalants was observed. The drugs that showed statistic significant increasing were: **lifetime use:** alcohol, tobacco, marijuana, inhalants, hallucinogens, amphetamines, anticholines, barbiturics and any illicit drug; **last-12-month use:** marijuana, inhalants, amphetamines, hallucinogens and any illicit drug; **last-30-day use:** marijuana, inhalants, amphetamines and any illicit drug. **Discussion:** The observed difference in the use of some drugs between the two surveys appears to be a consequence of the higher rates of favorable opinions regarding trying and regularly using some psychoactive substances, a finding that mirrors global trends in drug use.

Keywords: Alcohol drinking; Tobacco; Street drugs; Students; Cross-sectional studies

Resumo

Objetivo: Esta pesquisa teve como objetivo comparar as prevalências de uso de diversas drogas e as opiniões sobre esses usos entre estudantes de graduação da Universidade de São Paulo (USP) nos anos de 1996 e 2001. **Métodos:** Os dois estudos seguiram as mesmas metodologias de amostragem e coleta de dados. Os alunos foram randomicamente selecionados de acordo com suas áreas de estudo (Biológicas, Exatas e Humanas) e responderam a um questionário anônimo e de autopreenchimento, desenhado de modo a levantar o uso na vida, nos últimos 12 meses e nos últimos 30 dias de substâncias psicoativas lícitas e ilícitas. Para a comparação entre as duas pesquisas foram aplicados testes de Wald da igualdade das prevalências e construídos intervalos de confiança (95%) para a diferença entre as prevalências para cada substância investigada pelo total de alunos. **Resultados:** Observou-se aumento na aprovação do uso experimental e regular de cocaína, crack, anfetaminas e inalantes. As drogas que apresentaram aumento de uso estatisticamente significativo foram: na vida: álcool, tabaco, maconha, inalantes, alucinógenos, anfetaminas, anticolinérgicos, barbitúricos e ilícitas em geral; nos últimos 12 meses: maconha, inalantes, anfetaminas, alucinógenos e ilícitas em geral; nos últimos 30 dias: maconha, inalantes, anfetaminas e ilícitas em geral. **Discussão:** Os aumentos de uso observados entre as duas pesquisas parecem refletir as atitudes e opiniões favoráveis acerca do uso experimental e regular de algumas substâncias psicoativas e seguir uma tendência mundial de aumento do uso de drogas.

Descritores: Consumo de bebidas alcoólicas; Tabaco; Drogas ilícitas; Estudantes; Estudos transversais

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Introduction

1. Cross-sectional epidemiological studies on drug use among college students

Cross-sectional epidemiological studies, such as the present study, make it possible to formulate hypotheses regarding the factors that expose individuals with a specific trait to, or protect them from, for example, drug use.¹⁻² Cross-sectional epidemiological studies are especially useful for establishing prevalences and identifying risk factors for certain diseases or behaviors of interest.² The drug use pattern and its associated factors may be identified through the use of this method,² which, if repeated periodically, may provide data on how the variables under study behave over time, as well as whether it is possible to identify any trend, and may constitute a serial study.^{1,3} This kind of methodology has been traditionally used, and its results regarding the calculation of drug use prevalences and the possible risk factors that are correlated with such use have proven to be reliable. The main limitations of these kinds of studies refer to the possibility of establishing temporal relationships between these two categories of variables and, therefore, their causalities. When the objective is to establish this relationship, it is necessary to make use of prospective cohort studies.⁴

Various cross-sectional epidemiological studies designed to calculate drug use prevalences among college students have been carried out in Brazil in the last 25 years.⁵⁻¹⁶ Since they used different methodologies, with distinct samples, comparisons among the data obtained are of little validity. However, most of the studies are in agreement regarding two points: that alcohol and drug use among college students is greater than among the population in general and than among elementary and high school students; and that this use is, typically, recreational.

Few studies trying to characterize students in terms of the diagnoses of abuse or dependence have been carried out in Brazil. The fact that these questions have not been investigated may, in fact, give the impression that this kind of behavior is rarely observed among Brazilian college students. However, taking into account studies involving American college students, it is possible to conclude that the reality must be different. Wechsler et al¹⁷ calculated the prevalence of excessive alcohol use (defined as, in the same situation of use, within the last two weeks, five or more drinks for men and four drinks for women) as being 44% among the students of a national sample of American college students. Knight et al¹⁸ calculated, for the same sample of students, that, according to the DSM-IV, 31% fulfilled the criteria for a diagnosis of alcohol abuse and 6% for a diagnosis of dependence within the last 12 months.

Brazil lacks some very important data – information about drug use trends among college students. Since the studies mentioned above were carried at a single point in time, it is not possible to determine if drug use has increased, remains stable or has decreased among this population.

Another category of data that can be collected in a cross-sectional study is that of damage caused by excessive drug use on the part of college students. Kerr-Corrêa et al¹⁹ found a positive correlation between the frequency of alcohol use and a drop in academic performance. In his study, Yu²⁰ concluded that alcohol use happens in social interaction settings and that, the more inebriated the student becomes, the higher will be the risk of damage caused by this excessive use. Therefore, it seems important to invest in prevention programs that act on the several

forms of drug use in order to reduce experimentation, prevent abuse, avoid dependence and reduce the damage caused by any form of use, especially excessive use.

A recent study that provides a glimpse of a more up-to-date profile of drug use among college students other than those enrolled in universities in the state of São Paulo is that carried out by Mourão.²¹ The author carried out a survey of drug use among undergraduate students at four departments within the Federal University of Minas Gerais: Fine Arts, Library Science, Dentistry and Veterinary Medicine. The data obtained by Mourão²¹ are very similar to those obtained by Andrade et al²² and Kerr-Corrêa et al,¹⁹ reinforcing the findings of a group of studies that showed a relatively high prevalence of the use of various drugs among college students, especially in comparison to the population in general.²³⁻²⁶

2. Drug use among students at the University of São Paulo

The *Grupo Interdisciplinar de Estudos de Álcool e Drogas* (GREA, Interdisciplinary Group for Alcohol and Drug Studies) of the Department of Psychiatry of the University of São Paulo School of Medicine, with financial support provided by the *Fundação do Amparo à Pesquisa do Estado de São Paulo* (FAPESP, Foundation for the Support of Research in the State of São Paulo) and the formation of other partnerships, have contributed to shed some light on the issue of drug use among college students in the city and in the state of São Paulo.^{22,27-28} The study "Alcohol and Drugs: A Study on Attitudes and Use among Students of the University of São Paulo at São Paulo" (1995-96) showed a lifetime prevalence of illicit drug use of 38.1%, a prevalence within the last 12 months of 26.3% and a prevalence within the last 30 days of 18.9%,²² figures that are higher than those found by Galduróz et al²⁹ in their study of elementary and high school students and than those found by Magalhães et al¹⁴ in their study of college students in the city of São Paulo.

It has also been determined that the regular and experimental use of marijuana, which has been demonstrated to be a risk factor for the use of other drugs, is more often approved of by students at the University of São Paulo than is that of any other drug.³⁰ The authors of that study showed that students with a positive opinion of the experimental use of marijuana present a 2.7 times greater prevalence of having used some type of illicit drug within the last year, and that, among those who favor the regular use of marijuana, this prevalence is 3.2 times greater than among those who have an unfavorable opinion.

Methods

The objective of the present study was to compare the attitudes and patterns of alcohol and drug use among undergraduate students at the University of São Paulo in 1996 and in 2001.

1. Sample selection

The study sample was selected in a fashion similar to that of the first study carried out in 1996. The study population comprised students enrolled in any undergraduate course of the University of São Paulo (USP) in the 2000-2001 school year. According to the *Anuário Estatístico USP*³¹ (USP Statistical Yearbook), the most up-to-date reference at that time, the 1996 study population totaled 32,894 students. The objective was to estimate the proportions of students who made use of drugs in three time frames: lifetime use, use within the last 12 months and use within the last 30 days.

The sample used was stratified by area (the Humanities, Exact Sciences and Biological Sciences), in equal parts. We used the following sampling fraction:

$$f_h = \frac{n_h}{N_h}$$

where n is the number of students, n_h is the area, n_h is the number of students of the area included in the sample, and N_h is the total number of students enrolled in the area.

Students were selected by systematic random sampling. The sampling intervals were 15.1095, 5.2648 and 7.1061 in the Humanities, Biological Sciences and Exact Sciences, respectively. This random sampling was carried out by the Information Technology Department of the USP President's Office for Undergraduate Programs. The information about how the random sampling should be carried out and how the list of students selected should be issued was communicated by letter.

2. Calculation of the sample size

In order to determine the number of students to be interviewed in each area, it was decided that the absolute difference (sample error) between a particular proportion obtained by the sample and its value in the population should not exceed 0.05. The proportion of the behavior to be investigated was estimated to be 40% since the 1996 study determined this to be the proportion in the population under study: lifetime use of illicit drugs: 38.1%; 95% CI (35.3; 41.0).³²

We expected to obtain, in each area, a number of interviews that would make it possible to determine the estimates for groups of students by gender and class time of day. Therefore, the size of the sample determined above was divided by 0.37, which corresponded to the smallest percentage of students among these groups:

$$n = 369 \div 0.37 = 997$$

In order to compensate for possible losses of units selected at random, either because students failed to appear to complete the questionnaire or because it was necessary to exclude some questions, another 20% of the sample was selected at random. Taking into account the three areas, the total number of students selected at random was 3590.

3. Data collection method

The students completed an anonymous, self-administered questionnaire, designed so as to gather information about lifetime use, use within the last 12 months and use within the last 30 days of 14 licit and illicit psychoactive substances. This questionnaire was the same that was used in the 1996 study, and the only change made was the inclusion of ecstasy among the drugs to be investigated.

The questionnaires were applied on three occasions between the December of 2000 and October of 2001.

The first phase, as planned in the original project, occurred during the enrollment period at the end of 2000, between the 4th and the 22nd of December.

The second phase of application of the questionnaire was carried out between April and October of 2001.

The third phase consisted of replacing students from the units in which the samples suffered a loss greater than 20% of the students initially selected at random. Financial support for the development of the last two phases was provided by FAPESP.

Undergraduate students at USP itself were recruited and trained to administer the questionnaire. In order to standardize the type of approach and the information given to the subjects, these students attended two 120-min training sessions. The training included completing the study questionnaire themselves and discussing their questions regarding the objectives of the study, as well as regarding the formulation and understanding of the questions, the sampling methodology and suggestions. Subsequently, they were given an explanation of the approach and how the questionnaire would be administered: presentation of the material of the study, the use of the list of students selected at random, presentation and discussion of the written informed consent form, how to present the questionnaire and how to explain the study design. Finally, the students participated in role playing activities in order to experience the situation of approaching the subjects and explaining the study, asked questions and practiced a standardized approach.

There were a total of 2,837 valid questionnaires, which corresponds to 83.61% of the random sample. Of the 2,865 questionnaires collected, 28 were excluded because question 63 had been answered affirmatively. This question was formulated with false options in order to ensure the reliability of the responses.

The number of refusals were low (3.09%; 105 students), and the reason most often given for not participating was lack of time rather than suspicion of the intentions of the study. The remainder of the sample losses were due to inability to find students in the classrooms before the study deadline.

4. Method of data analysis

The analyses were carried out during data collection and at the end of the study. During data collection, the objective of the analyses was to follow the data collection evolution and obtain preliminary results that made it possible to monitor the process. At the end of the study, statistical analyses were carried out in order to compare the results of this study to those of the study carried out in 1996. The comparisons between the results of the two studies were made using the Wald test³³ of heterogeneity among the prevalences of each substance investigated. The total number of students by area and the total number of USP students were taken into account.³³

Variance estimator:

$$\hat{p}_h = \frac{\sum_{i=1}^{n_h} y_{hi}}{n_h} \quad \text{for } h = 1, 2, 3$$

$y_{hi} = 1$ if the i -th student of the area (h) has used the drug under study and 0 if not.

$n_h =$ number of students of the area (h) who completed the questionnaire on the drug under study.

$$\text{Var}(\hat{p}_h) = \frac{(N_h - n_h)\hat{p}_h(1 - \hat{p}_h)}{N_h(n_h - 1)} \quad \text{for } h = 1, 2, 3$$

$N_h =$ number of students enrolled in the area.

Results

1. Comparison of the sociodemographic profile of the students

The comparison between the sociodemographic profiles of the students surveyed in 1996 and those surveyed in 2001 shows that the two samples were similar in several aspects (Table 1).

Table 1 – Comparison between the 1996 and 2001 samples of USP undergraduate students regarding their distribution by area of study, class year and gender

	1996		2001	
	n	%	n	%
Area				
Humanities	697	27.20	967	34.00
Biological Sciences	1014	39.60	923	32.40
Exact Sciences	849	33.20	958	33.60
Total	2560	100.00	2848	100.00
Course schedule				
Daytime	1922	76.10	2157	76.00
Nighttime	605	23.90	680	24.00
Total	2527	100.00	2837	100.00
Gender				
Male	1450	57.00	1649	57.80
Female	1093	43.00	1202	42.20
Total	2543	100.00	2841	100.00

2. Information regarding, and attitudes toward, drug use

It was estimated that 28.09% of the students had experimented with some type of illicit drug before entering USP. Most of the students (32.82%) made use of drugs (excluding alcohol and tobacco) for the first time with friends or partners. The drugs most often experimented with before entering college were marijuana (83.78%), inhalants (43.66%), hallucinogens (18.29%) and cocaine (14.07%). Most of the students who had already experimented with some illicit drug (excluding alcohol and tobacco) did so either out of curiosity (21.59%) or for fun/pleasure (13.17%).

Of those who make frequent use of drugs, most do so in order to enjoy the effects – Table 2.

Table 2 – Distribution of the valid questionnaires according to reasons for frequent drug use

Reasons for frequent drug use	n	%
Denied any such use	2279	85.07
To be part of a group of friends and/or colleagues from college	63	2.35
To break the routine	75	2.80
To enjoy the effects of the drug	162	6.05
To relieve anxiety or stress and relax	97	3.62
To avoid or relieve withdrawal symptoms	3	0.11
Total	2679	100.00
Blank and null responses	158	

* statistically significant difference

Of the people who interact with the students socially, those who make the most frequent use of drugs are their friends. The drugs most often used are tobacco (53.98%), alcohol (49.24%) and marijuana (40.03%).

Most of the students who use drugs frequently report sleep disturbance (5.39%), reduced academic achievement (5.13%), altered eating habits (4.13%) and impaired athletic performance (4.09%) – Table 3.

Table 3 – Distribution of the valid questionnaires according to the type of impairment caused by the frequent drug use

	Yes	%	Total
Denied any such use	2239	83.39	2685*
Altered eating habits	111	4.13	2688
Sleep disturbances	145	5.39	2688
lower academic achievement	138	5.13	2688
Inhibited sexual performance	62	2.31	2688
Professional/work implications	67	2.49	2688
Impaired social/affective interaction	99	3.68	2688
Limited athletic ability	110	4.09	2688
Other	35	1.30	2688
No impairment	179	6.66	2688

*The difference regarding the number of questionnaires of those who reported some type of interference is due to a higher number of blank or excluded questionnaires.

The majority (97.49%) had never been involved in a traffic accident after using drugs.

Most of the students (86.91%) had no family members with alcohol problems.

In 1996, there was greater approval of experimenting with alcohol (difference of 6.7%* [95% CI: 4.2%-9.2%]) and with tranquilizers (difference of 17.5%* [95% CI: 15.3%-19.7%]). In 2001, there was greater approval of experimenting with cocaine (difference of 27.6%* [95% CI: 24.9%-30.2%]), crack (difference of 5.5%* [95% CI: 3.8%-7.2%]), amphetamines (difference of 7.6%* [95% CI: 5.2%-10.0%]) and inhalants (difference of 3.8%* [95% CI: 1.4%-6.2%]). Student opinions about experimenting with marijuana did not differ between the two years. In 1996, there was greater approval of the regular use of alcohol (difference of 4.9%* [95% CI: 1.8%-7.9%]) and tranquilizers (difference of 2.8%* [95% CI: 1.6%-4.0%]), whereas, in 2001, there was greater approval of the regular use of marijuana (difference of 5.7%* [95% CI: 3.1%-8.4%]), cocaine (difference of 16.5%* [95% CI: 14.7%-18.3%]), crack (difference of 1.4%* [95% CI: 0.5%-2.3%]), amphetamines (difference of 2.9%* [95% CI: 1.6%-4.2%]) and inhalants (difference of 1.5%* [95% CI: 0.3%-2.6%]).

3. Comparison of 1996 and 2001 drug use

Tables 4, 5 and 6 indicate the drugs whose use increased significantly from 1996 to 2001. The other drugs investigated in our study presented no significant change in terms of consumption. None of the drugs presented any significant decrease in consumption between the two time periods investigated.

In comparison to the first study, use of illicit drugs (grouped into a single category) presented a significant increase in the three time frames studied: lifetime use (from 39.4% to 45.1%, $p = 0.0002$), use within the last 12 months (from 28.0% to 31.2%, $p = 0.0291$) and use within the last 30 days (from 17.3% to 21.8%, $p = 0.0008$). We observed a significant increase in lifetime use of illicit drugs among the students of the area of the Humanities (from 41% to 48.8%). With regard to course time of day, we observed an increase in lifetime use of illicit drugs (from 38.68% to 43.19%) and in use within the last 30 days (from 16.72% to 20.73%) among the students who study during the day and an increase in all three time frames among those who study at night: lifetime use (from 40.20% to 49.01%), use within the last 12 months (from 27.51% to 37.67%) and use within the last 30 days (from 18.56% to 23.96%). With regard to gender, comparison of the use of illicit drugs in general between men and women in 1996 and in 2001 revealed that, among men, there was an increase in lifetime use (from 42.94% to 48.07%) and in use within the last 30 days (from 19.08% to 25.03%), and that there was an increase in lifetime use among women (from 34.23% to 41.25%).

We observed that there was a significant increase in lifetime use of the following drugs: alcohol (from 88.5% to 91.9%, $p = 0.0062$), tobacco (from 42.8% to 50.5%, $p < 0.001$), marijuana (from 31.1% to 35.3%, $p = 0.0012$), hallucinogens (from 6.1% to 11.4%, $p < 0.001$), amphetamines (from 4.8% to 9.0%, $p < 0.001$), anticholinergics (from 1.1% to 2.9%, $p < 0.001$), inhalants (from 17.9% to 24.5%, $p < 0.001$) and barbiturates (from 1.0% to 1.7%, $p = 0.0212$) – Table 4.

Table 5 shows that there was a significant increase in the use within the last 12 months of the following: marijuana (from 19.0% to 22.8%, $p = 0.0096$), hallucinogens (from 3.5% to 5.0%, $p = 0.0036$), amphetamines (from 2.7% to 5.3%, $p < 0.001$) and inhalants (from 8.8% to 13.5%, $p < 0.001$).

The following were the drugs whose use within the last 30 days increased significantly: marijuana (from 14.0% to 16.9%, $p = 0.0386$), amphetamines (from 2.2% to 3.4%, $p = 0.0018$) and inhalants (from 4.1% to 6.5%, $p < 0.001$) – Table 6.

Discussion

The statistical analysis focused on three blocks of variables: the sociodemographic profiles of the students; opinions regarding drug use and the consequences of such use; and rates of drug use in the two years studied (1996 and 2001).

1. Sociodemographic profiles

The two samples were comparable in terms of their sociodemographic profile. Both were populations of undergraduate USP students, and the same sampling methodology was used. The differences found are related to changes observed in the populations of reference rather than to any differences in sampling or data collection procedures adopted in the two studies. However, some differences in the characteristics of the students may explain, in part, the differences between the prevalences found in the statistical analysis.

One factor that may have influenced the results of this comparison was the concentration of students in the 20-24 age group. In 1996, 60.1% of the students interviewed were in this age group, whereas, in 2001, the rate was 67.8%. It is known

Table 4 - Drugs that presented statistically significant differences in the comparison between the proportion of students who ever made use of some drug by drug and by area of study, as well as by 1996 and 2001 totals (95% confidence interval)

		Lifetime use (%)							Interval for the difference	
		1996		2001		Difference	p value			
		Total	USP total	Total	USP total			USP total		
Alcohol	Humanities	87.00	88.50	90.40	91.90	3.40	0.006	0.90	5.70	
	Exact Sciences	90.20		93.10						
	Biological Sciences	91.10		94.80						
Tobacco	Humanities	44.00	42.80	54.10	50.50	7.70	< 0.001	4.90	10.40	
	Exact Sciences	39.50		44.20						
	Biological Sciences	44.50		48.20						
Marijuana	Humanities	32.70	31.10	39.90	35.30	4.20	0.001	1.60	6.70	
	Exact Sciences	26.80		28.60						
	Biological Sciences	32.80		30.10						
Hallucinogens	Humanities	7.40	6.10	13.20	11.40	5.30	< 0.001	3.90	6.60	
	Exact Sciences	4.00		9.00						
	Biological Sciences	5.60		9.20						
Amphetamines	Humanities	5.40	4.80	9.60	9.00	4.20	< 0.001	3.00	5.30	
	Exact Sciences	2.60		6.90						
	Biological Sciences	6.60		10.20						
Anticholinergics	Humanities	1.10	1.10	3.90	2.90	1.80	< 0.001	1.20	2.30	
	Exact Sciences	1.10		1.70						
	Biological Sciences	1.30		1.60						
Inhalants	Humanities	17.90	17.90	25.40	24.50	6.60	< 0.001	4.50	8.60	
	Exact Sciences	16.80		19.30						
	Biological Sciences	20.00		29.10						
Barbiturates	Humanities	1.10	1.00	2.2	1.70	0.70	0.021	0.10	1.20	
	Exact Sciences	0.90		1.0						
	Biological Sciences	1.10		0.80						
Illicit	Humanities	41.00	39.40	48.80	45.10	5.70	< 0.001	2.70	8.70	
	Exact Sciences	34.30		36.70						
	Biological Sciences	42.10		45.60						

Table 5 - Statistically significant differences between 1996 and 2001 in the student use of some drugs within the last 12 months by drug type and by area of study, as well as by 1996 and 2001 totals (95% confidence interval)

		Use within the last 12 months (%)							
		1996		2001		Difference	p value	Interval for the difference	
		Total	USP total	Total	USP total				USP total
Marijuana	Humanities	21.20	19.90	26.10	22.80	2.90	0.010	0.70	5.00
	Exact Sciences	15.70		17.40					
	Biological Sciences	22.40		19.80					
Hallucinogens	Humanities	4.20	3.50	5.40	5.00	1.50	0.004	0.50	2.50
	Exact Sciences	2.10		3.90					
	Biological Sciences	3.20		5.20					
Amphetamines	Humanities	3.00	2.70	5.70	5.30	2.60	< 0.001	1.80	3.50
	Exact Sciences	1.20		3.40					
	Biological Sciences	3.80		6.80					
Inhalants	Humanities	8.00	8.80	13.70	13.50	4.70	< 0.001	3.20	6.10
	Exact Sciences	8.00		10.20					
	Biological Sciences	12.50		17.30					
Illicit	Humanities	28.50	28.00	33.90	31.20	3.20	0.029	0.30	6.00
	Exact Sciences	23.70		24.00					
	Biological Sciences	32.90		32.60					

Table 6 – Statistically significant differences between 1996 and 2001 in the student use of some drugs within the last 30 days by drug type and by area of study, as well as by 1996 and 2001 totals (95% confidence interval)

		Use within the last 30 days (%)							
		1996		2001		Difference	p value	Interval for the difference	
		Total	USP total	Total	USP total				USP total
Marijuana	Humanities	15.50	14.90	19.90	16.90	2.00	0.039	0.10	3.90
	Exact Sciences	12.60		12.50					
	Biological Sciences	16.40		13.70					
Amphetamines	Humanities	2.40	2.20	3.90	3.40	1.20	0.002	0.50	2.00
	Exact Sciences	1.10		2.30					
	Biological Sciences	3.00		3.50					
Inhalants	Humanities	3.20	4.10	6.30	6.50	2.40	< 0.001	1.40	3.40
	Exact Sciences	4.20		4.60					
	Biological Sciences	6.80		9.70					
Illicit	Humanities	17.00	17.30	24.00	21.80	4.50	0.001	1.80	7.00
	Exact Sciences	15.10		16.20					
	Biological Sciences	21.20		22.50					

that this age group presents the highest lifetime prevalence of use for most of the drugs studied.³⁴ Therefore, the greater number of students in this age group may be correlated with the increased prevalences of drug use observed between the two years.

Finally, the characteristic "religion" also draws attention because of the differences found between the two samples and the fact that it is a protective factor against the use of psychoactive substances.^{30,35-39} In 1996, 72.9% of the students claimed to have a religion, and 34.5% practiced the religion professed. In 2001, 63.9% claimed to have a religion, and 40.3% practiced the religion professed.

2. Data related to opinions and attitudes regarding drug use and its consequences

These data are extremely intriguing since they indicate more liberal attitudes regarding the use of illicit substances and are a cause for concern since they reflect a trend observed in Brazilian society. Taken together with the data indicating increased consumption, a truly alarming situation becomes apparent,

characterized by the increased consumption of illicit psychoactive substances, and more favorable opinions of such use.

The same comparison was performed regarding opinions regarding experimentation with some psychoactive substance. It is interesting to contemplate the apparent contradiction that these data reveal. Despite the increased rates of endorsement of experimental and regular use of crack and cocaine, there was no significant increase in the use of these substances between 1996 and 2001.

The comparison between the two years revealed increased endorsement of experimentation with and regular use of various drugs. In his study, Queiroz demonstrated that a favorable opinion toward drug use correlates with the effective use of the same drugs.³⁰ This finding corroborates, in part, our results demonstrating increased consumption of several substances. However, that does not explain the fact that the consumption of crack and cocaine remained stable from 1996 to 2001 despite the increased endorsement of the use of these substances. Further studies are needed in order to clarify this issue.

A plausible hypothesis is that there has been underreporting of the use of cocaine and crack. Comparison of the results of the present study regarding the variable "use within the last 30 days" to those obtained by Kerr-Corrêa et al¹⁹ among students of the *Universidade Estadual Paulista* (UNESP, São Paulo State University) revealed that the prevalence was higher among UNESP students: 2.9% versus 1.23% for cocaine use; and 0.5% versus 0.18% for crack use.

A third group of variables, in association with these two, may further clarify the meaning of these data. This third group consists of perceptions regarding the various adverse consequences of the frequent use of drugs. Table 3 shows that the students who make frequent use of drugs (6.66%) think that this use does not interfere with any aspect of their lives. Among those who perceived some type of impairment (9.95%), the most prevalent was sleep disturbance (5.39%), reduced academic performance (5.13%) and altered eating habits (4.13%).

Yu investigated the negative consequences of the use of alcohol among college students and demonstrated that these consequences are directly correlated with the level of use and affect their peers, the other students.²⁰ Another hypothesis put forward by this author is that the negative consequences may be better understood as a phenomenon that results from a group process rather than from individual circumstances, that is, having certain social norms in common influences choices of substance types, patterns of use and the way students view the consumption of these substance by their peers. Among the consequences resulting from alcohol abuse, Lanier et al⁴⁰ enumerated the following as expressive spheres of damage prevalence among college students: missing classes, driving under the effect of alcohol, and doing something that they will later regret.

With regard to the reasons given for using drugs, Lanier et al⁴⁰ studied the correlation between the desire to achieve a sensation of well-being and drug use. The authors found that the stress index is correlated with the use of alcohol and drugs, reinforcing the hypothesis that the aim of this use is often to achieve a general sensation of well-being. Another interestingly, the authors also found that students who participate in sports activities tend to reduce their stress levels in ways other than using drugs, thereby decreasing consumption. Their data revealed that one of the main areas affected by drug use is athletic performance. Therefore, it seems that there is a real correlation between these two variables. The authors also cite Perkins,⁴¹ who found that using alcohol as a means of reducing stress was the main reason for such use among undergraduate students.

However, in the present study, we found that most of the students who had already experimented with some illicit drug did so out of curiosity or for fun/pleasure. Of those who made frequent use of drugs, most did so to "enjoy" the effects. Stress reduction was the second most often reported reason for the frequent use of illicit drugs.

Further studies are needed in order to increase understanding of these differences and of how the sensations pursued through the use of a certain substance are directly or indirectly correlated with the pursuit of a sensation of well-being and relief from the stress created by the academic environment.

3. Comparison of 1996 and 2001 drug use

Comparison between the data obtained in 2001 and those obtained in 1996 reveal that, over that five-year period, there

was a significant increase in consumption: 1) increased lifetime use of alcohol, tobacco, marijuana, hallucinogens, amphetamines, anticholinergics, inhalants and barbiturates; 2) increased use within the last 12 months of marijuana, hallucinogens, amphetamines and inhalants; 3) increased use within the last 30 days of marijuana, amphetamines and inhalants (Tables 4, 5 and 6).

The parameters used to compare the data obtained in the present study and to understand the meaning of these increases in the prevalences were derived from data on the evolution of drug consumption among the population in general and among similar specific populations in Brazil and in the world.

The study carried out by Galduróz et al²⁹ demonstrated some trends toward an increase in drug use among Brazilian elementary and high school students in the last 10 years. In the city of São Paulo, increases in the lifetime use of marijuana, cocaine and tobacco, as well as in the frequent use of marijuana, cocaine and alcohol, and in the abuse of marijuana, cocaine and alcohol, were observed. These results are consistent with the global trends toward increased consumption of these substances among the population in general.⁴² However, the Monitoring the Future Survey,⁴³ a 27-year, ongoing study involving a national sample of eighth-, tenth- and twelfth-graders in the United States has demonstrated that, over a recent four-year period, the rates of use of illicit drugs remained stable, and disapproval of experimentation with marijuana increased. These data may represent a shift toward a decrease in the consumption of certain drugs.

With regard to use within the last 30 days, use within the last 12 months, and lifetime use, marijuana was the illicit drug most often used among USP students, a finding that coincides with those of other studies involving Brazilian students,²⁹ American students⁴³ and other college populations in many countries.^{3,14,19,21,44} Marijuana is also the drug whose regular and experimental use was most often approved of by students attending the University of São Paulo. As previously mentioned, marijuana has been found to be a risk factor for the use of other illicit drugs.³⁰

Data obtained in the *IV Levantamento sobre o Uso de Drogas entre Estudantes de 1º e 2º graus em 10 Capitais Brasileiras*²⁹ (IV Survey of Drug Use among Elementary and High School Students in 10 Brazilian Capitals), together with global data,⁴² indicate an increase in the use of cocaine. In the United States, however, the Monitoring the Future Survey⁴³ demonstrated a decrease in the use of cocaine and crack between 2000 and 2001. According to responses given by USP students, cocaine and crack were the drugs that they least approved of,³⁰ which may explain the fact that the prevalence of its use remained unchanged. Nevertheless, as previously discussed, our results indicate that the level approval increased between 1996 and 2001. These data may represent a gradual shift in the opinion of college students. Although this change is not, as yet, reflected in the epidemiological data, it is suggested by the prevalence of use among an immediately younger population: elementary and high school students. One alarming finding is that cocaine addiction is the second main reason for seeking treatment for drug dependence among USP students.⁴⁵ Although cocaine consumption did not reach a high prevalence and remained stable over the five-year period analyzed, it induces dysfunctional patterns of use that cause serious damage. This is therefore another factor that merits further investigation.

In the 2001 questionnaire, we included questions about the use of ecstasy, a drug whose use has increased among students in the United States,⁴³ in European countries and in developing countries.⁴² We found a prevalence of 2.3% for the lifetime use of this drug, compared with 1.4% for use within the last 12 months and 0.8% for use within the last 30 days. These data indicate that ecstasy use among USP students surpasses the use of other, more well-known, drugs that have been on the market longer, such as crack, anticholinergics and opiates.

These data reveal a very specific epidemiological profile, and the factor "social class" seems to be important to determining which are the most favorably viewed and most widely used drugs. However, drugs such as crack and anticholinergics are more prevalent in more vulnerable populations, such as young homeless people⁴⁶ or internees of the juvenile correction facility, the *Fundação do Bem-Estar do Menor do Estado de São Paulo* (FEBEM, Foundation for the Well-Being of Minors in the State of São Paulo).⁴⁷

Consumption of inhalants and amphetamines increased in all three time frames studied – lifetime use, use within the last 12 months and use within the last 30 days. Increased amphetamine consumption has also been shown in other countries,⁴² and inhalant consumption seems to be highly prevalent, especially in Brazil.

Conclusions

Comparison of drug use patterns among USP undergraduate students in 1996 and in 2001 revealed statistically significant increases: lifetime use of alcohol (from 88.5% to 91.9%, $p = 0.0062$), tobacco (from 42.8% to 50.5%, $p < 0.001$), marijuana (from 31.1% to 35.3%, $p = 0.0012$), hallucinogens (from 6.1% to 11.4%, $p < 0.001$), inhalants (from 17.9% to 24.5%, $p < 0.001$) and barbiturates (from 1.0% to 1.7%, $p = 0.001$); use within the last 12 months of marijuana (from 19.9% to 22.8%, $p = 0.0096$), hallucinogens (from 3.5% to 5.0%, $p = 0.0036$), amphetamines (from 2.7% to 5.3%, $p < 0.001$) and inhalants (from 8.1% to 13.5%, $p < 0.001$); and use within the last 30 days of marijuana (from 14.9% to 16.9%, $p = 0.0386$), amphetamines (from 2.2% to 3.4%, $p = 0.0018$) and inhalants (from 4.1% to 6.5%, $p < 0.001$).

Although drug prevalences among USP undergraduate students remain high in comparison to those found among the population in general and among Brazilian elementary and high school students, they are similar to those found among students at other Brazilian universities.

Comparison of student attitudes toward experimentation and regular use of drugs revealed that approval of the experimental use of cocaine, crack, amphetamines and inhalants, as well as of the regular use of marijuana, cocaine, crack, amphetamines and inhalants, was higher in 2001 than in 1996.

Despite the increased acceptance of the use of all drugs, the highest levels of approval in 2001 were for the use of alcohol, tobacco and marijuana. Crack and cocaine were the drugs that presented the lowest levels of student approval. The highest levels of approval regarding regular use were also found for alcohol, tobacco and marijuana, and illicit drugs (except marijuana) presented the highest rates of disapproval.

The data obtained in the present study show that the degree and extent of the use of psychoactive substances among undergraduate students attending the University of São Paulo is significant. These data indicate a possible trend toward an

increase in the consumption and endorsement of several substances. Therefore, programs for prevention and treatment of problems related to drug use should be expanded. Special attention should be given to alcohol consumption since, in addition to being the drug most often used by students, the consequences of its excessive use affect young college students more often than those of the use of other drugs.

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