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Gabriela Arantes Wagner[I]

Lúcio Garcia de Oliveira[I]

Lucia Pereira Barroso[II]

Raphael Nishimura[III]

Luciana Morita Ishihara[II]

Vladimir de Andrade Stempliuk[IV]

Paulina do Carmo Arruda Vieira Duarte[IV]

Arthur Guerra de Andrade[I]

Drug use in college students: a 13-year trend

Uso de drogas entre alunos universitários: tendências em 13 anos

ABSTRACT

OBJECTIVE: To analyze drug use trends among college students in 1996, 2001 and 2009.

METHODS: A cross-sectional epidemiological study with a multistage stratified cluster sample with 9,974 college students was conducted in the city of São Paulo, southeastern Brazil. An anonymous self-administered questionnaire was used to collect information on drug use assessed in lifetime, the preceding 12 months and the preceding 30 days. The Bonferroni correction was used for multiple comparisons of drug use rates between surveys.

RESULTS: There were changes in the lifetime use of tobacco and some other drugs (hallucinogens [6.1% to 8.8%], amphetamines [4.6% to 8.7%], and tranquilizers [5.7% to 8.2%]) from 1996 to 2009. Differences in the use of other drugs over the 12 months preceding the survey were also seen: reduced use of inhalants [9.0% to 4.8%] and increased use of amphetamines [2.4% to 4.8%]. There was a reduction in alcohol [72.9% to 62.1%], tobacco [21.3% to 17.2%] and marijuana [15.0% to 11.5%] use and an increase in amphetamine use [1.9% to 3.3%] in the preceeding 30 days.

CONCLUSIONS: Over the 13-year study period, there was an increase in lifetime use of tobacco, hallucinogens, amphetamines, and tranquilizers. There was an increase in amphetamine use and a reduction in alcohol use during the preceding 12 months. There was an increase in amphetamine use during the preceding 30 days.

DESCRIPTORS: Students. Substance Abuse, epidemiology. Substance-Related Disorders, epidemiology. Alcohol-Related Disorders, epidemiology. Cross-Sectional Studies. Brazil.

[I] Departamento de Psiquiatria. Faculdade de Medicina. Universidade de São Paulo (USP). São Paulo, SP, Brasil

[II] Departamento de Estatística. Instituto de Matemática e Estatística. USP. São Paulo, Brasil

[III] Institute for Social Research. Ann Arbor, MI, USA

[IV] Secretaria Nacional de Políticas sobre Drogas. Ministério da Justiça. Brasília, DF, Brasil

Correspondence:
Gabriela Arantes Wagner
R. Costa Aguiar, 1375 – Apto. 54
Ipiranga
04204-001 São Paulo, SP, Brasil
E-mail: gabrielaaw@usp.br

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RESUMO

OBJETIVO: Analisar a tendência do uso de drogas entre universitários entre 1996, 2001 e 2009.

MÉTODOS: Estudo epidemiológico transversal com 9.974 universitários do município de São Paulo, SP, cuja amostra foi selecionada por estratificação e conglomerados. Adotou-se instrumento de pesquisa de autopreenchimento, anônimo, que caracterizou o uso de drogas por três medidas: uso na vida, nos últimos 12 meses e nos últimos 30 dias. Para comparação de frequências de uso de drogas entre as pesquisas, utilizou-se a metodologia de comparações múltiplas com correção de Bonferroni.

RESULTADOS: Houve redução da frequência de estudantes que relataram consumo de drogas entre 1996 e 2009. Houve diminuição do uso de inalantes e aumento do uso de anfetamínicos em todas as medidas avaliadas [4,6% para 8,7% na vida, de 2,4% para 4,5% nos últimos 12 meses e de 1,9% a 3,3% nos últimos 30 dias]. Os alunos das Ciências Humanas relataram uso de drogas com maior frequência [48,6% na vida, 29,0% nos últimos 12 meses e 20,9% nos últimos 30 dias].

CONCLUSÕES: Entre os 13 anos de estudo, houve aumento de uso na vida de tabaco, alucinógenos, anfetaminas e tranquilizantes; além do aumento do uso de anfetaminas nos últimos 12 meses e diminuição do uso de álcool. Em relação aos últimos 30 dias, houve aumento do uso de anfetaminas.

DESCRITORES: Estudantes. Abuso de Substâncias, epidemiologia. Transtornos Relacionados ao Uso de Substâncias, epidemiologia. Transtornos Relacionados ao Uso de Álcool, epidemiologia. Estudos Transversais. Brasil.

INTRODUCTION

Drug use in young people has heralded social and political changes that have taken place in other social spheres in European countries and the United States. It is a challenge for public policymakers as new uses of old drugs must be identified for planning effective actions.

Drug use among the young is greater in developing than developed countries.[a,b,c] A Brazilian study including a sample of the general population aged 12 to 65 years in the 108 largest Brazilian cities showed that 22.8% of 7,939 respondents reported use of at least one drug (other than tobacco and alcohol) once in their lifetime.[d] Considering drug use by age groups, 78.6% of those aged 18 to 24 years had tried alcohol, 39.5% tobacco and 10.8% inhalants. Inhalants seem to be mostly abused by Brazilian young people. College students have deserved attention because they suffer serious consequences resulting from illicit drug use or the use of a combination of drugs such as alcohol use with tobacco, marijuana and cocaine.[1,6,10,13-15]

According to epidemiological studies conducted in the United States, about 30% of college students reported tobacco use in the preceding 30 days —a high rate considering the information available on the risks of smoking—, about 20% or less reported using marijuana, and less than 2% reported using cocaine.[6] The First Nationwide Survey on the use of alcohol, tobacco and other drugs among college students carried out in 27 Brazilian state capitals[e] showed that 48.7% of students reported using illicit drugs in their lifetime. Marijuana was the substance most frequently used, followed by amphetamines, tranquilizers, inhalants and hallucinogens, especially regarding recent use (use in the preceding 12 months and in the preceding 30 days). Illicit drug use was greater among students from the Southern and Southeastern regions.

[a] United Nations Office for Drug Control and Crime Prevention.World Drug Report.Vienna; 2008.
[b] United Nations Office for Drug Control and Crime Prevention.World Drug Report.Vienna; 2009.
[c] United Nations Office for Drug Control and Crime Prevention.World Drug Report.Vienna; 2010.
[d] Carlini EA, Carlini-Contrim B, Silva-Filho AR. II Levantamento Nacional Sobre o Uso de Psicotrópicos em Estudantes de 1º e 2º graus. São Paulo: Centro Brasileiro de Informações sobre Drogas Psicotrópicas. Universidade Federal de São Paulo; 2007.
[e] Andrade AG, Duarte PCAV, Oliveira LG. I Levantamento nacional sobre o uso de álcool, tabaco e outras drogas entre universitários das 27 capitais brasileiras. Brasília: Secretaria Nacional de políticas sobre Drogas; 2010.

Similarly to the University of Michigan Monitoring the Future Study,[6] the Universidade de São Paulo (USP) carried out a study on drug use among its students aiming to identify trends and developing prevention actions and intervention strategies targeted to this population.[e] Three cross-sectional surveys were carried out at the USP in 1996, 2001 and 2009[1,13,e] by the Interdisciplinary Group for Alcohol and Drug Studies.

The first study (1996) pointed out that alcohol and tobacco were the most widely-consumed drugs, with prevalences of use of 82.5% and 25.6% in the preceding 12 months.[13] Drug use was greater among males and students not living with their families.

The study conducted in 2001 revealed some changes. There was an increase in the rate of experimentation with alcohol, tobacco, marijuana and hallucinogens,[1,13] as well as increased use of tobacco, marijuana, amphetamines and inhalants over the preceding 30 days[14] among males. No specific increases were observed among females.

A third study was conducted in 2009 to follow up drug use changes at the USP from 1996. The present study aimed to analyze drug use trend in college students between 1996 and 2009.

METHODS

Cross-sectional epidemiological study with 9,974 undergraduate college students from a public university conducted in the state of São Paulo, Southeastern Brazil. In the first two studies (1996 and 2001), the sampling unit was the student selected by means of systematic random sampling stratified according to study area (Arts & Humanities, Biological Sciences, and Mathematical and Physical Sciences). The sample was selected from students enrolled in any undergraduate course through the statistical yearbook. In 2009 college students were selected by means of stratified sampling including clusters of unequal size.[3,f] The primary sampling unit was the student classroom (set of students attending a given class). The sample was stratified according to the study area and student classrooms were defined as clusters. Since a class may include students from several different colleges, the number of students per study area was totaled and the percentage corresponding to each area was calculated. The area with the highest proportion of students was defined as a study area.

It was assumed that the absolute difference between a given proportion obtained for the sample and the corresponding proportion for the entire population should lie within a 95% confidence interval, with a 5% margin of error. The sample size would be equivalent to 40%, i.e., the prevalence of use of at least one illicit drug in lifetime, according to the outcomes of the first wave of this series of studies (38.1% [95% CI 35.3; 41.0]). Another 20% of the sample was randomly selected to compensate for potential losses of colleges or questionnaires.

Based on a reference list of undergraduate students, 228 classrooms were selected to participate in the study (76 for each study area). This estimate was based on the planning effect which is dependent on the average cluster size and intraclass correlation coefficient.[13] All students in each classroom selected were contacted. The total number of students was determined by the classroom selected. The sample comprised 4,759 respondents, 81.1% of the students selected in 2009 (92.6% in 1996 and 79.1% in 2001). The total sample comprised 9,974 students (2,374 participants in 1996 and 2,841 participants in 2001) (Table 1). The distribution of students in 2009 according to study area was 39.6%, 30.7%, and 29.7% from Arts & Humanities, Mathematical and Physical Sciences and Biological Sciences, respectively (Table 2).

The study questionnaire was adapted from a research instrument developed by the World Health Organization.[1,13] Drug use was assessed in lifetime (experimental use "at least once in their lifetime"), in the preceding 12 months (i.e., "at least once in the 12 months preceding the survey") and in the preceding month (i.e., "at least once in the 30 days preceding the survey"). It was an anonymous self-administered questionnaire comprising 58 closed-ended questions. Students took on average 30 minutes to complete the questionnaire.

The adapted instrument assessed the profile of the students: a) sociodemographic information (gender, age, marital status, socioeconomic status, ethnic group and others); b) undergraduate course attended

Table 1. Sample design and total number of college student respondents in the three waves of the study. São Paulo, Southeastern Brazil, 1996, 2001 and 2009.

Sample Design	1996	2001	2009
Type of sample	Systematic random sample stratified by study area	Systematic random sample stratified by study area	Cluster sampling stratified by study area
Number of respondents	2,374	2,841	4,759
Total	2,564	3,590	5,871

[f] Wagner GA, Barroso LP, Stempliuk VA, Andrade AG. Álcool e drogas: terceira pesquisa sobre atitudes e uso entre alunos da Universidade de São Paulo – campi Cidade Universitária, Faculdade de Direito e Complexo da Saúde. In: Andrade AG, Duarte PCAV, Oliveira LG. I Levantamento nacional sobre o uso de álcool, tabaco e outras drogas entre universitários das 27 capitais brasileiras. Brasília: Secretaria Nacional de políticas sobre Drogas; 2010. p.129-47.

Table 2. Sociodemographic characteristics of students by area of study. São Paulo, Southeastern Brazil, 2009.

Variable	Arts & Humanities		Mathematical and Physical Sciences		Biological Sciences		Total	
	%	n	%	n	%	n	%	n
Gender								
Male	44.0	830	73.9	1,078	34.5	487	50.3	2,395
Female	55.5	1,048	25.8	377	65.2	922	49.4	2,347
Missing information	0.5	9	0.3	4	0.3	4	0.3	17
Age group (years)								
15 to 19	20.6	388	23.7	346	20.5	290	21.5	1,024
20 to 24	53.6	1,012	61.3	895	68.2	964	60.3	2,871
25 to 29	14.5	273	9.5	138	8.7	123	11.2	534
30 or over	11.0	208	5.2	76	2.3	32	6.7	316
Missing information	0.3	6	0.3	4	0.3	4	0.3	14
Marital status								
Single	86.4	1,630	89.3	1,303	96.0	1,356	88.8	4,226
Married / Living together	12.1	228	9.1	133	3.6	51	9.9	471
Separated	0.9	17	1.0	15	0.2	3	0.8	38
Widowed	0.3	6	0.2	3	0.0	0	0.2	10
Missing information	0.3	6	0.4	6	0.2	3	0.3	14
Children								
Yes	7.1	134	6.4	93	2.1	30	6.1	290
No	92.6	1,747	93.1	1,358	97.6	1,379	93.6	4,454
Missing information	0.3	6	0.5	7	0.3	4	0.3	14
Religion								
Yes	56.3	1062	59.7	871	66.8	944	59.0	2,808
No	43.5	821	40.0	584	33.0	466	40.8	1,942
Missing information	0.2	4	0.3	4	0.2	3	0.2	10
Paid job for one month in the last six months								
Yes	68.0	1,283	57.2	835	50.7	716	62.2	2,960
No	30.8	581	42.4	619	49.2	695	37.0	1,761
Missing information	1.2	23	0.4	6	0.1	1	0.8	38
Academic performance								
Passed	70.2	1,325	52.6	767	75.1	1,061	66.5	3,165
Needed to take an examination, but passed	4.9	92	6.6	96	9.5	134	6.1	290
Needed to repeat courses but did not fail to progress in the academic year	12.1	228	22.2	324	8.3	117	14.1	671
Failed	1.5	28	3.4	50	0.5	7	1.8	86
Other	9.3	175	12.4	181	4.6	65	9.3	443
Missing information	2.0	38	2.8	41	2.0	28	2.2	105
Period of study								
Daytime	44,8	846	85,7	1.250	75,0	1.060	3.156	66,3
Evening	54,3	1.024	13,9	203	24,6	347	1.574	33,1
Missing information	0,9	17	0,4	6	0,4	6	29	0,6
Total	39.6%	1,887	30.7%	1,459	29.7%	1,413	100.0	4,759

(study area, academic year and term); c) academic life events (involvement with college activities and places of socialization); and d) academic performance and satisfaction about the undergraduate course chosen, among other factors.

The focus of the study was to investigate undergraduate college student use of alcohol and other drugs (tobacco, marijuana, cocaine hydrochloride, crack cocaine, methamphetamines, anticholinergics, tranquillizers, opiates, barbiturates, anabolic androgenic steroids, inhalants,

Table 3. Proportion of lifetime drug use in three surveys and differences between them. São Paulo, Southeastern Brazil, 1996, 2001 and 2009.

Drug	Lifetime use														
	1996			2001			2009			2001-1996		2009-2001		2009-1996	
	%	n	SD	%	n	SD	%	n	SD	min	max	min	max	min	max
Alcohol	91.4	2228	0.71	92.2	2520	0.60	92.5	4403	0.69	-1.44	2.99	-1.84	2.52	-1.24	3.47
Tobacco	44.5	1084	1.21	51.0	2425	1.06	52.1	2477	1.48	2.63	10.33*	-3.27	5.46	3.01	12.15*
Marijuana	31.6	770	1.13	35.4	969	1.03	33.6	1597	1.39	0.19	7.51*	-6.01	2.26	-2.31	6.27
Hallucinogens	6.1	147	0.61	11.4	311	0.70	8.8	417	0.91	3.10	7.51*	-5.34	0.15	0.10	5.33*
Cocaine	6.9	168	0.63	6.5	177	0.55	7.3	345	0.89	-2.43	1.55	-1.71	3.29	-2.26	2.95
Crack cocaine	0.8	19	0.20	1.0	28	0.22	1.2	55	0.22	-0.49	0.94	-0.61	0.88	-0.34	1.07
Amphetamines	4.6	111	0.51	9.4	258	0.63	8.7	413	0.68	2.95	6.83*	-3.00	1.45	2.08	6.15*
Anticholinergics	0.9	23	0.23	3.1	85	0.39	1.7	80	0.32	1.08	3.26*	-2.63	-0.19*	-0.19	1.71
Inhalants	18.3	446	0.94	24.7	674	0.92	18.8	896	1.26	3.22	9.51*	-9.57	-2.09*	-3.22	4.30
Tranquilizers	5.7	139	0.58	7.4	201	0.59	8.2	388	0.67	-0.29	3.65	-1.35	2.92	0.35	4.58*
Opiates	0.8	19	0.21	1.4	37	0.26	1.4	68	0.19	-0.21	1.40	-0.72	0.84	-0.03	1.34
Barbiturates/ sedatives	0.9	21	0.23	1.9	52	0.32	1.2	58	0.27	0.14	2.00*	-1.71	0.29	-0.49	1.21
Anabolic steroids	0.4	10	0.12	0.5	14	0.15	0.8	39	0.18	-0.34	0.57	-0.26	0.87	-0.11	0.95
Ecstasy	-	0.0	-	3.7	102	0.43	6.5	310	0.63	-	-	1.28	4.28*	-	-
Other drugs	39.4	961	1.19	45.7	1249	1.06	43.7	2079	1.63	2.45	10.07*	-6.67	2.65	-0.58	9.07

α = 0.05, * statistically significant

hallucinogens and ecstasy) through the description of the frequency of use in their lifetime and in the preceding 12 months and preceding 30 days. A fictitious drug called Relevin was included in the questionnaire to test the reliability of the responses.[g] A positive answer on the use of this drug invalidated the entire questionnaire, thus preventing the use of this data in the analysis. Six questionnaires were excluded from the analysis.

The data were collected between March and November 2009. Valid questionnaires were single-entered using SPSS. Quality control was performed by retyping 70% of the questionnaires. When the database was complete, consistency analyses and general checks were performed.

All statistical analyses were performed using SPSS for Windows version 13.1 and SAS version 9.2. A descriptive analysis was conducted with the 2009 data. Data was weighted as they were based on complex sampling plans. A trend analysis could not be performed due to the small number of surveys (three) and a comparison between drug use prevalence was performed using the Bonferroni method,[2,8,12] which consisted in dividing the global significance level (5%) by the number of tests. Comparisons were also made using simultaneous confidence intervals.

This study was approved by the Research Ethics Committee of Clínicas Hospital of the Universidade de São Paulo Medical School (protocol number 0378/08). All respondents who agreed to participate in the study signed a free informed consent form.

RESULTS

The sample consisted mostly of male (50.3%) young students aged 20 to 24 years (60.3%), unmarried (88.8%), childless (93.6%) and attending daytime undergraduate courses (66.3%).

In the preceding year, 66.5% of the respondents passed all their subjects while 15.4% failed in one subject but not in the entire academic year.

Almost 60% of the students (59.0%) reported having a religion. However, 54.8% reported actively observing their faith, and Evangelicals (83.2%) and Spiritists (63.1%) were the most devout. Although Catholicism was the most commonly reported religion (59.2%), 43.7% reported religious observance and practice (Table 2).

Most students (75.1%) reported they had not experimented with illicit drugs before college. Among those who had, marijuana was the most reported (83.7%), followed by solvents (40.5%), hallucinogens (13.7%), cocaine (13.1%) and ecstasy (10.0%).

Among sampled students, 81.5% reported the use of drugs in 2009. Among these, 92.5% used alcohol,

[g] Hibell B, Guttormsson U, Ahlström S, Balakireva O, Bjarnason T, Kokkevi A, et al. The 2007 ESPAD Report: Substance Use Among Students in 35 European Countries. Sweden: The Swedish Council for Information on Alcohol and other Drugs; 2009.

Table 4. Proportion of drug use in the 12 months preceding the survey in three surveys and differences between them. São Paulo, Southeastern Brazil, 1996, 2001 and 2009.

Drug	Use in the preceding 12 months														
	1996			2001			2009			2001–1996		2009–2001		2009–1996	
	%	n	SD	%	n	SD	%	n	SD	min	max	min	max	min	max
Alcohol	82.5	2011	0.93	80.5	2200	0.86	80.0	3806	1.01	-5.03	1.02	-3.67	2.68	-5.78	0.78
Tobacco	25.4	619	1.05	26.7	731	0.96	23.6	1122	0.98	-2.03	4.77	-6.45	0.11	-5.24	1.64
Marijuana	20.3	496	0.98	22.8	623	0.91	18.5	879	1.18	-0.76	5.65	-7.87	-0.75*	-5.53	1.80
Hallucinogens	3.4	82	0.45	5.0	137	0.47	4.0	188	0.48	0.08	3.22*	-2.65	0.57	-0.96	2.19
Cocaine	3.5	85	0.45	2.9	80	0.39	2.4	115	0.36	-1.96	0.89	-1.79	0.74	-2.45	0.33
Crack cocaine	0.4	9	0.14	0.2	4	0.09	0.2	11	0.08	-0.59	0.20	-0.20	0.36	-0.49	0.26
Amphetamines	2.4	59	0.37	5.4	148	0.49	4.5	212	0.51	1.52	4.46*	-2.66	0.70	0.51	3.52*
Anticholinergics	0.3	8	0.13	0.7	20	0.20	0.3	12	0.10	-0.15	1.00	-1.02	0.06	-0.45	0.34
Inhalants	9.0	220	0.67	13.5	369	0.73	4.8	227	0.54	2.07	6.81*	-10.87	-6.53*	-6.32	-2.19*
Tranquilizers	3.2	78	0.43	4.0	109	0.44	4.4	208	0.48	-0.71	2.24	-1.14	1.96	-0.37	2.72
Opiates	0.3	7	0.13	0.6	15	0.16	0.6	28	0.14	-0.26	0.75	-0.47	0.54	-0.18	0.73
Barbiturates/ sedatives	0.3	8	0.14	0.9	24	0.22	0.4	20	0.14	-0.05	1.19	-1.08	0.17	-0.35	0.57
Anabolic steroids	0.1	3	0.06	0.4	10	0.12	0.2	8	0.06	-0.12	0.53	-0.51	0.15	-0.17	0.23
Ecstasy	-	0.0	-	2.0	53	0.32	1.6	76	0.21	-	-	-1.10	0.39	-	-
Other drugs	26.6	648	1.07	31.8	869	1.00	25.5	1211	1.36	1.71	8.71*	-10.38	-2.31*	-5.26	3.00

α = 0.05, * statistically significant

52.1% tobacco and 43.7% other drugs. In the 12 months preceding the survey, 80.0% of the students used alcohol, 23.6% tobacco and 25.5% other drugs. As for the preceding month, 62.1% of the students used alcohol, 17.2% tobacco and 17.4% other drugs.

There were changes in the lifetime use of tobacco and some other drugs (hallucinogens, amphetamines, and tranquilizers) from 1996 to 2009 (Table 3). Differences in the use of other drugs over the 12 months preceding the survey were also seen: reduced use of inhalants and

Table 5. Proportion of drug use in the 30 days preceding the survey in three surveys and differences between them. São Paulo, Southeastern. Brazil, 1996, 2001 and 2009.

Drug	Use in the preceding 30 days														
	1996			2001			2009			2001–1996		2009–2001		2009–1996	
	%	n	SD	%	n	SD	%	n	SD	min	max	min	max	min	max
Alcohol	72.9	1776	1.08	68.9	1882	1.00	62.1	2953	1.42	-7.52	-0.48*	-10.94	-2.66*	-15.06	-6.54*
Tobacco	21.3	520	0.99	21.9	600	0.90	17.2	817	0.89	-2.58	3.83	-7.80	-1.75*	-7.32	-0.97*
Marijuana	15.0	364	0.87	16.2	442	0.81	11.5	548	0.90	-1.62	4.04	-7.53	-1.76*	-6.41	-0.45*
Hallucinogens	1.6	39	0.31	2.4	66	0.34	2.5	119	0.41	-0.31	1.87	-1.16	1.36	-0.34	2.10
Cocaine	1.8	43	0.32	1.5	40	0.28	1.3	60	0.20	-1.32	0.72	-1.04	0.61	-1.43	0.40
Crack cocaine	1.0	2	0.04	0.0	1	0.03	0.1	6	0.05	-0.15	0.09	-0.06	0.23	-0.11	0.22
Amphetamines	1.9	45	0.33	3.4	93	0.40	3.3	157	0.45	0.32	2.78*	-1.54	1.32	0.12	2.77*
Anticholinergics	0.2	4	0.10	0.4	10	0.14	0.2	11	0.10	-0.24	0.59	-0.53	0.29	-0.28	0.38
Inhalants	3.8	90	0.43	6.4	174	0.51	2.9	138	0.47	0.93	4.12*	-5.13	-1.78*	-2.45	0.59
Tranquilizers	2.2	52	0.37	2.4	65	0.34	3.2	152	0.42	-1.03	1.38	-0.48	2.11	-0.35	2.33
Opiates	0.2	4	0.10	0.4	10	0.13	0.4	17	0.11	-0.21	0.57	-0.40	0.41	-0.16	0.53
Barbiturates/ sedatives	0.2	5	0.11	0.5	15	0.18	0.4	17	0.13	-0.17	0.81	-0.73	0.34	-0.28	0.54
Anabolic steroids	0.0	1	0.03	0.1	3	0.07	1.0	4	0.05	-0.11	0.26	-0.23	0.18	-0.07	0.18
Ecstasy	-	0.0	-	1.0	28	0.23	0.8	37	0.16	-	-	-0.79	0.32	-	-
Other drugs	19.0	445	0.94	22.3	610	0.90	17.4	828	1.15	0.20	6.44*	-8.40	-1.41*	-5.14	1.97

increased use of amphetamines. There was a reduction in alcohol, tobacco and marijuana use and an increase in amphetamine use in the preceding 30 days (Table 4).

DISCUSSION

Over the 13-year study period, an increase in the lifetime use of tobacco, hallucinogens, amphetamines and tranquilizers was seen. There was an increase in amphetamine use and a reduction in alcohol use in the 12 months prior to the study. In the preceding 30 days, there was an increase in amphetamine use.

Female students were found to consume more tobacco, marijuana, anticholinergics and inhalants in the 30 days preceding the survey and were major consumers of tranquilizers and amphetamines in 2001.[14] Among American college students, as shown in the University of Michigan Monitoring the Future Study, tranquilizer use followed a cohort behavioral pattern.[6] This behavior was particular in the sample studied: there was a rising consumption from 1996 to 2009 with a tendency towards stabilization from 2001 to 2009. However, female students continued to prefer amphetamines and tranquilizers.

The popularity of amphetamines can be attributed to its ease production and ready availability, which facilitates purchase and experimentation. Data from the Brazilian population show an increase in consumption of appetite suppressants from 2001 to 2005, as previously reported among middle and high school students from 1987 to 2004.[4] These students seem to consume alcohol, tobacco, marijuana, hallucinogens and synthetic drugs more often than Brazilian college students in general.[h]

Both experimentation and regular use of alcohol seem to have reached a ceiling, particularly among Biological Sciences and Arts & Humanities students. Alcohol is also the most widely used drug among Brazilian college students in general among both males and females. Use is initiated at the age of 16.[5] Even though alcohol-related disorders are more prevalent among adults over 25 years old, high-risk use is more frequent among young drinkers. Such use is associated with several negative consequences and is one of the main causes of morbidity and mortality among college students.[i] The most prevalent negative consequences of alcohol use are traffic accidents, violence, sexual abuse, sexual harassment, health problems, declines in academic performance and interpersonal problems.[9,11]

Experimentation with ecstasy has also shown an increase since 2001, the year its analysis was introduced into the research instrument. Paradoxically, there was a reduction in inhalant use for all measurements over the 13-year period, which might be related to an increased use of ecstasy or reduced consumption of inhalants by the students sampled.

Increased drug use among students from 1996 to 2001 reflected worldwide and Brazilian trends, especially compared with Brazilian middle and high school students. However, drug use between 2001 and 2009 did not change and was similar to US patterns.[10] The data suggesting increased drug use among young people in developing compared with developed countries are paradoxical since a steady state was reported among these students.[c] It describes a significant fraction of middle and upper-middle class Brazilian youth who have high access to information and education equivalent to first-world countries, maybe because São Paulo has the largest socioeconomics characteristics in Brazil.

The degree and extend of psychoactive drug use among undergraduate students attending the university studied is significant. Special attention should be given to alcohol consumption and increased consumption of other substances mainly in the preceding 30 days. Prevention and treatment programs targeting drug use should be expanded in Brazil. About 28.0% of the Brazilian universities have developed programs for drug use prevention and/or guidance/counseling. Of these, seven institutions have their programs reviewed, and it has been identified in a single program the need for implementing curriculum components that address participatory and preventive education with regard to drug use among the students and colleges here studied.[e]

The change in the study design, from a stratified random sample (1996 and 2001) to a cluster sample (in 2009) made the fieldwork easier, as less time was required for data collection, analysis of results and identification of drug use trends. However, the introduction of a selection method using clusters increased the variability among the respondents and reduced the accuracy that had previously been achieved in the 1996 and 2001 studies. This difficulty was offset by an increase in sample size. Weights were assigned to the sampling units in the three studies so that the distribution of respondents in the sample would reflect the distribution of students in the general college population, without affecting the results or their scope. Although the sample design in the 2009 study was different from the previous years, the comparability was not limited. Kish[7] (1965) stated that comparison between distinct sampling plans does not interfere with or bias the inferential analyses

[h] Nicastri S, Oliveira LG, Wagner GA, Andrade AG. Prevalência e padrão de uso de tabaco e outras drogas (exceto álcool): estimativa de abuso e dependência. In: Andrade AG, Duarte PCAV, Oliveira LG. I Levantamento nacional sobre o uso de álcool, tabaco e outras drogas entre universitários das 27 capitais brasileiras. Brasília: Secretaria Nacional de políticas sobre Drogas; 2010. p.129-82.

[i] Oliveira LG, Galduróz JCF, Wagner GA, Andrade AG. Uso de drogas pelos universitários brasileiros: contexto nacional e internacional. In: Andrade AG, Duarte PCAV, Oliveira LG. I Levantamento nacional sobre o uso de álcool, tabaco e outras drogas entre universitários das 27 capitais brasileiras. Brasília: Secretaria Nacional de políticas sobre Drogas; 2010. p.129-97.

provided these have been based on good selection and probability methods.

Drug use among undergraduate college students at the university studied remains high compared with other Brazilian contexts, but these students appear to be consuming fewer drugs than that reported in the 1996 and 2001 surveys, particularly regarding drug use in the preceding 30 days. The prevalence of alcohol use in this population is remarkable as a ceiling for lifetime use was reached (92.5%).

Further studies are needed to better understand the differences between respondents and non-respondents (e.g., missing school days), in order to determine whether among those who missed class there was a higher prevalence of drug use. Other surveys are needed for improving the understanding of this population.

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