

Caffeine, Tobacco, Alcohol and Drug Consumption Among Medical Students in Barcelona

Joan-Ramon Laporte, J. Camí, R. Gutiérrez, and J. Laporte

Departamento de Farmacologia, Universidad Autònoma de Barcelona, Spain

Summary. A survey of medical students was conducted at the Universitat Autònoma de Barcelona in 1974. Out of 1029 students, 808 present at lectures (78.5%) returned properly completed questionnaires. These showed that mean caffeine consumption was 8.3 g per month and increased with the length of stay at the university. Tobacco consumption (general mean, 190 cigarettes per month, 216 for males and 150 for females) and alcohol consumption (8.8 litres/year for males and 4.1 litres/year for females) also increased with time spent at university. Alcohol consumption was not as high as in the general population. Amphetamine consumption was very high (22% of students had taken amphetamines on more than one occasion in the six months prior to the survey). Marihuana and hashish were by far the most commonly used drugs (9.6%), the use of these drugs being much less common than at other European universities. The use of "harder" drugs was very limited. Appraisal of alcohol, tobacco and amphetamine abuse is necessary, since the authorities have not employed adequate measures to stop or limit them.

Key words: Caffeine consumption, alcohol and tobacco consumption, marihuana consumption, amphetamine abuse, dmg abuse.

Non-medical use of drugs among students has been investigated in many countries, but data from Spain are lacking or are very limited [1]. Furthermore, general data on consumption of coffee, tobacco, alcohol and drugs of non-medical use in the general population are also very scarce in our country. Data on tobacco consumption are only obtainable from

figures of production, and so are those for alcohol. The only information on the use of psychedelic and other addictive drugs is public notes from the police and an annual report from the Supreme Court. In the more general setting of a study of the epidemiology of drug abuse in the general population in Spain, it was decided to begin with a survey of the consumption of caffeine, alcohol, tobacco and drugs of non-medical use among medical students. Accordingly, a questionnaire (see Appendix) was designed for distribution at selected lectures in 1974 to students in their six years of their medical training.

Methods

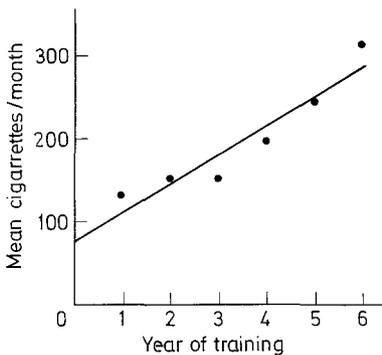
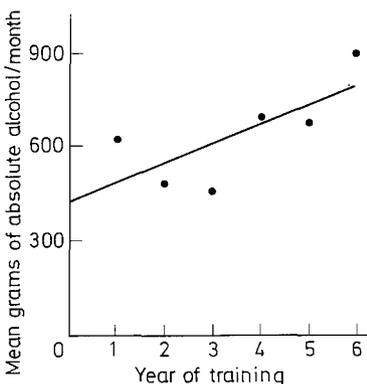
Questionnaires were distributed and collected with the co-operation of lecturers before the lecture began. Distribution was preceded by a short explanation of the reasons for the survey, and the students were then allowed 15 minutes to complete and return the questionnaire.

With reference to caffeine, questions were asked about consumption of black coffee, two regular forms of coffee with milk taken in Spain, a very common sort of beverage composed of coffee plus a spirit, tea, cola drinks, and mixed cola drinks with spirits. A cup of coffee is estimated to contain about 125 mg of caffeine, a cup of tea about 75 mg, and a cola drink of 150 ml contains about 22 mg [2]. Answers in the questionnaires (see Appendix) were always re-expressed as the weight of caffeine taken per month.

To know the extent of tobacco consumption, we inquired (see Appendix) how many cigarettes, cigars and pipes were smoked per day by students. As will be seen, cigar and pipe consumption was insignificant, and was omitted from final calculations of tobacco use.

Table 1. Caffeine consumption per month by students

Sample	Number of Students	Mean coffee consumption (Cups)	Mean tea consumption (Cups)	Mean cola consumption (Bottles)	Mean total caffeine consumption (grams)
1st year	239	58.0	6.8	14.8	8.1
2nd year	206	57.4	3.7	12.0	7.7
3rd year	125	60.4	4.6	13.4	8.2
4th year	88	61.3	5.9	11.1	8.3
5th year	98	69.8	6.8	11.5	9.5
6th year	52	68.4	4.4	17.4	9.3
Males	515	58.8	4.5	13.8	8.0
Females	293	63.9	7.0	12.2	8.9
Total	808	60.7	5.4	13.2	8.3

**Fig. 1.** Increase in cigarette consumption per month with the year of medical training**Fig. 2.** Increase in mean alcohol consumption (grams of absolute alcohol) with the year of medical training

Alcohol consumption was studied by inquiring about consumption of beer, cider, champagne, table wine, the mixture of coffee with a spirit mentioned above, fortified wines, mixed cola drinks, bitter, ver-

mouth and aperitive wines, and various spirits. Answers were re-expressed in grams of absolute alcohol taken per month. These values are very variable in different types of alcoholic beverages and commercial preparations, namely with wine and beer, but they apply to the most common beer and table wines consumed in Spain.

The Appendix also shows how inquiries were made about the consumption of amphetamine and non-medical drugs.

Results

Out of 1029 students matriculating in a six year period, 818 were present at the lectures chosen, and 808 (515 males and 293 females) returned properly completed questionnaires (response rate of 78.5%).

Caffeine consumption tended to increase with length of time at university ($r = 0.1152$; $p < 0.01$, Table 1)

Cigarette smoking was by common. French-type cigarettes were smoked to a greater extent by males than by females. The mean number of the cigarettes smoked by males was 201 cigarettes per month, the mean for females being 135 cigarettes per month (total mean: 175 cigarettes/month). Virginia tobacco cigarettes, on the other hand, are consumed to a much smaller extent in Spain: total mean was 15 cigarettes per month, and there was no significant difference between males and females. The increasing prevalence of cigarette smoking with length of time in the faculty is shown in Figure 1. Pipe and cigar smoking was almost insignificant compared to use of cigarettes: 3.6 pipes/month and 0.7 cigars/month.

Alcohol consumption was much greater among males than females. The former consumed 8.8 litres of absolute alcohol per year, and the latter 4.1 litres per year. In both cases consumption of alcohol was much less than that of the general population of Spain: about 12 litres per year [3]. However, alcohol consumption, like caffeine and tobacco consumption, increased with length of time at university (Fig. 2), and in the later part of the medical course it kept up with that of the general population.

In the six month period prior to the survey, amphetamines had been used by 182 students (22.5%) and had been used more than four times in the same period by 155 (19.2%). There was no significant difference between males and females in these figures. Amphetamines had occasionally been used together with other non-medical drugs by 51 students (36 males and 15 females), which represented 6.3% of the total population surveyed (Table 2).

Table 2. Amphetamine consumption by students

	More than one occasion in the last six months		More than four occasions in the last six months		Occasionally, with other non-medical drugs	
	Number of Students	% of Students	Number of Students	% of Students	Number of Students	% of Students
Males	115	22.3	103	20.0	36	7.0
Females	67	22.9	52	17.7	15	5.1
Total	182	22.5	155	19.2	51	6.3

Table 3. Exposure to non-medical drugs

Sample	Males		Females			
	Total	Offered drugs		Total	Offered drugs	
		Number of Students	% of Students		Number of Students	% of Students
1st year	141	44	31.2	98	24	24.5
2nd year	126	22	17.5	80	13	16.2
3rd year	83	21	25.3	42	5	11.9
4th year	54	16	29.6	34	5	14.7
5th year	66	29	43.9	32	14	43.8
6th year	45	17	37.8	7	4	57.1

Almost a third of the male (28.9%) and a quarter of the female students (22.2%) had been offered drugs (Table 3). Of the 214 students who had been offered drugs, 95 (44.4%) took them at least once (Table 4). Of the 808 students who completed the questionnaire, 31 (3.8%) acknowledged that they were still taking drugs. Here again, there was an increase in consumption of the non-medical drugs listed in the Appendix (Fig. 3). Cannabis and LSD had been consumed by 9.6% and 2.1% respectively. Opiate derivatives (0.6%) and cocaine (0.4%) had been used to an insignificant extent.

Discussion

A major obstacle to the investigation of drug taking in Spain is the legal sanction against use of drugs other than tobacco or alcohol for non-therapeutic purposes. Other difficulties which arise in studies made with anonymous questionnaires are nonres-

Table 4. Acceptance and taking of non-medical drugs by students

	Males		Females	
	Number of Students	% of Students	Number of Students	% of Students
Drugs not accepted	81	55.1	38	58.5
Drugs accepted and stopped	45	30.2	19	29.2
Drugs accepted and still taken	23	15.7	8	12.3
Total	149	100	65	100

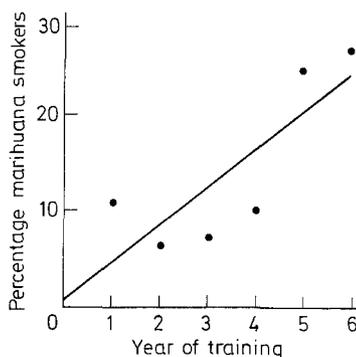


Fig. 3. Increase in percentage of students who had used marijuana at least once in the six months prior to the survey in each year of the medical training

ponse, response error and forgetting. In our opinion, fear of legal sanctions is the main obstacle to this type of study in Spain, and this was the reason why an anonymous questionnaire was selected for the survey. A response rate of 78.5% on the basis of the students attending a Spanish university must be considered a very high rate, and therefore gives considerable validity to the study.

The number of students who had been offered drugs and the mean consumption of cigarettes, alcohol and drugs of non-medical use increased with the year of training (Table 3, Figs. 1, 2, 3), and therefore with the time spent in the Faculty. In all these four figures it can be seen that results obtained from students in the first year were higher than expected from those obtained in other years. This could be attributed to the fact that first year students were not an integrated group with respect to the other groups of medical students.

McKay et al. [4] also found an increase in the proportion of students who had been offered drugs

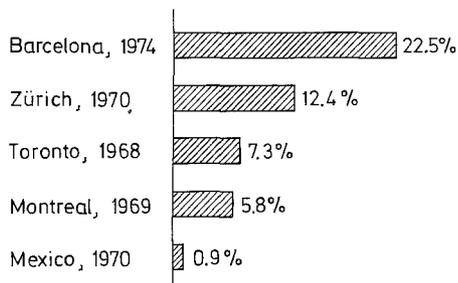


Fig. 4. Percentage of students who had taken amphetamines at least once in the six months prior to the survey in certain universities. Note that the percentage in Barcelona Autonomous University is almost double that in any other institution

as they stayed for a longer period at university: However, although these authors did not question students about tobacco and alcohol consumption, they did report results about distribution in each of the four years they studied.

There was a very high consumption of amphetamine in this survey. Comparison of the results with those from other universities (see Fig. 4), in which amphetamine consumption in a similar group of students has been examined by similar questions, shows that in our University amphetamine consumption was very common. As explained elsewhere [5], the medical student has many opportunities to write false prescriptions. However, amphetamine abuse is not restricted to the University: there are in Spain 85 pharmaceutical preparations containing amphetamine or pharmacological analogues of amphetamine, and in the past twelve months nine million units of amphetamine products have been consumed, amounting to about 17 million U.S. dollars. Furthermore, legal regulations on prescription and dispensing are not strictly applied in Spain. 37% of amphetamine-containing pharmaceutical products do not bear the warning "Available only under medical prescription". In a survey made at the Faculty of Medicine of Cadiz, Calcedo [1] found that only 18% of the students who had taken amphetamines had got them on prescription, legally or illegally.

As in other universities in Europe, the drug of non-medical use most often taken by students was marihuana, although its consumption was not as prevalent as in other universities (Fig. 5). Equally, the predominance of "soft" as opposed to "hard" drug-taking indicates a less critical problem than in other areas of Europe and the U.S.A. [6].

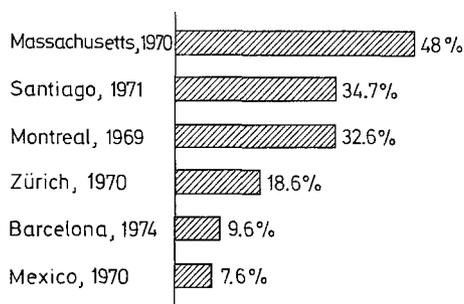


Fig. 5. Percentage of students in various universities who had taken marihuana or hashish at least once in the six months prior to the survey

References

1. Calcedo Ordóñez, A.: Uso y abuso de psicoestimulantes y otras drogas en el medio universitario. (A propósito de una encuesta). *Actas luso-esp. Neurol. Psiquiatr.* **30**, 129–150 (1971)
2. Nagy, M.: Caffeine content of beverages and chocolate. *J. Amer. med. Ass.* **229**, 337 (1974)
3. Piqueras, F.: In *Informe sobre el alcoholismo*, (p. 11). Oviedo: Ediciones Naranco 1973
4. McKay, A. J., Hawthorne, V. M., McCartney, H. N.: Drug taking among medical students at Glasgow University. *Brit. med. J.* **1973** *i*, 540–543
5. Cami, J., Laporte, J., Gutiérrez, R., Laporte, J. R.: Estudio de los preparados que contienen amfetamina existentes en el mercado farmacéutico nacional *Medicina clínica* **68**, 57–62 (1977)
6. Mercer, G. W., Smart, R. G.: The epidemiology of psychoactive and hallucinogenic drug use. In: *Research Advances in Alcohol and Drug Problems, Volume 1.* (Ed. R. J. Gibbins, Y. Israel, H. Kalant, R. E. Popham, W. Schmidt and R. G. Smart) (Chapt. 7., pp. 303–354). New-York: John Wiley 1974

Appendix

Survey on pharmacology

This survey is aimed at obtaining objective information on the use of certain products among students in our country. Therefore, if you answer this questionnaire (you are not obliged to do so), please do it seriously.

This survey is strictly anonymous and confidential. All information will be treated as strictly confidential, will be used only by persons engaged in, and for the purposes of this survey, and will not be disclosed for any other purposes.

Section one

Instructions

This survey refers to the use of the following substances *in the last six months.*

In each question, please indicate number of doses of the products written on the left (no. of cigarettes, no. of glasses, etc.) in the

appropriate column ("per day", "per week", "per month", "sometimes in the last six months", and "never"). Please answer columns "never" and "sometimes in the last six months" with YES or NO. If you answer other columns ("per day", "per week", "per month"), please write an approximative quantity (for example 10-15, in the question "French-type tobacco", in the column "per day").

Age Sex Male Female Year

	per day	per week	per month	Sometimes in the last six months	Never
French-type tobacco (n° cigarettes)					
Virginia-type tobacco (idem)					
Pipe tobacco (n° pipes)					
Cigars (n°)					
Black coffee (cups)					
Coffee with milk (short) (cups)					
Coffee with milk (large) (cups)					
"Carajillo" (coffee plus spirit)					
Tea (cups)					
Cola beverages (bottles)					
Mixed cola drinks (with spirits)					
Beer (330 ml)					
Cider (120 ml)					
Champagne (120 ml)					
Table wine (125 ml)					
Fortified wines (sherry, etc.) (70 ml)					
"Bitter" (125 ml)					
Vermouth & aperitive wines (85 ml)					
Brandy or cognac (30 ml)					
Whisky (30 ml)					
Rum (30 ml)					
Gin (30 ml)					
Anisette (30 ml)					
Cointreau (30 ml)					
Other spirits (30 ml)					

Section two

- Have you taken any medication to combat fatigue or to obtain stimulation in the last six months?
 - No
 - Yes, more than one occasion
 - Yes, more than four times
- Please, indicate the commercial name and number of doses of the stimulant you have taken
.....
- Have you been offered drugs for other than medical reasons in the last six months?
 - Yes
 - No
- Have you taken drugs for other than medical purposes in the last six months?
 - Yes
 - No
- Please, indicate the drug or drugs you have used
 - Marihuana
 - Hashish
 - Amphetamine
 - LSD
 - Opium
 - Morphine
 - Heroin
 - Cocaine
 - Others or combinations; please specify
- Do you still take this drug/s?
 - Yes
 - No

Received: March 2, 1976, accepted: December 6, 1976

Dr. Joan-Ramon Laporte
 Universidad Autónoma de Barcelona
 Facultad de Medicina
 Dpto. de Farmacología y Terapéutica
 Avda. San Antonio M. Claret, 169
 Barcelona - 13, Spain