Original Paper

Drug consumption in adolescents 13 to 18 years old and other related risky behaviors

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Abstract

Introduction: one of the most important problems in our public health system nowadays is drug consumption and the risky behaviors related to it.

Objective: to analyze drug consumption prevalence in adolescents attending high school in the province of Valladolid and its relation with other factors.

Material and methods: a 101 question survey about alcohol consumption, school performance, leisure time, accidents, tobacco, drugs, mistreatment, relationship with other persons, food habits and sexual behavior has been used. The final number of students 13 to 18 years old surveyed was 2,412 in the Valladolid province during the year 2012.

Results: had taken at least one alcoholic drink 77.2%, 36.7% had smoked tobacco, 17% had smoked cannabis, 2.5% had taken relaxing and sleeping pills with medical prescription, 1.9% had taken speed or amphetamines, 1.3% had taken relaxing and sleeping pills without medical prescription, 1.1% had taken speed, 1% had consumed cocaine and 0.7% had inhaled volatile inhalants at some time. A proportion of 38.3% of them had consumed two or more substances. The average for starting tobacco and alcohol consumption is from 13 to 14 years old, and 15 to 16 years old for illegal drugs. There has been a correlation between some risky habits and the factors that helped to develop them.

Conclusions: a lot of adolescences start drug use in the pediatric age. Multidrug use is a prevalent standard that increases risks. Pediatricians in Primary Medical Care have a lot of work to do in different points such as prevention, diagnosis and treatment.

Key words:
- Drugs
- Alcohol
- Tobacco
- Adolescence
- Multidrug use

Consumo de sustancias adictivas en los adolescentes de 13 a 18 años y otras conductas de riesgo relacionadas

Resumen

Introducción: uno de los mayores problemas de salud pública es el consumo de tóxicos y las conductas de riesgo relacionadas con los mismos.

Objetivo: analizar la prevalencia de consumo de sustancias adictivas en los adolescentes escolarizados de la provincia de Valladolid, así como su relación con diversos factores.

Material y métodos: se utilizó un cuestionario de 101 preguntas relacionadas con el consumo de alcohol, rendimiento escolar, ocio, accidentes, tabaco, drogas, maltrato, relaciones con los demás, alimentación y sexualidad, de la que se extrajeron los datos relacionados con el alcohol, el tabaco y otras drogas. El número final de alumnos encuestados fue de 2412 escolares de 13 a 18 años en la provincia de Valladolid, durante el año 2012.

Resultados: un 77,2% de los encuestados había tomado bebidas alcohólicas alguna vez; un 36,7%, tabaco; un 17%, cannabis; un 2,5%, tranquilizantes con receta; un 1,9%, *speed* o anfetaminas; un 1,3%, tranquilizantes sin receta; un 1,1%, éxtasis; un 1%, cocaína, y un 0,7%, inhalantes volátiles. Un 38,3% de los adolescentes había consumido dos o más sustancias. La edad media de inicio del consumo de alcohol y tabaco se situó entre los 13 y los 14 años, y de drogas ilegales, entre los 15 y los 16 años. Se observó asociación de hábitos de riesgo y factores que influyeron en el desarrollo de los mismos.

Conclusiones: muchos adolescentes inician el consumo de drogas en la edad pediátrica. El policonsumo es un patrón muy prevalente que aumenta los riesgos. El pediatra de Atención Primaria puede hacer mucho en aspectos preventivos, diagnósticos y terapéuticos.

Palabras clave:
- Drogas
- Alcohol
- Tabaco
- Adolescencia
- Policonsumo de drogas

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INTRODUCTION

Drug use and the consequences that come with it constitute a social and public health problem that affects both Spain and the entire international community.[1]

A drug is any substance that acts on the central nervous system, leading to the experience of new sensations or an altered psychological state, that is, to changes in behaviour.[2] By this definition, the term includes legal substances (tobacco, alcohol, and hypnosedatives) as well as illegal ones (such as hashish, heroin, cocaine, synthetic drugs, etc).

The drug use figures published by the specialised agencies of the United Nations,[3] the European Union,[4-6] and the Plan Nacional sobre Drogas (Spanish National Plan on Drugs)[7,8] leave no room for doubt. A significant portion of the population, largely comprised by young adults and even adolescents, consume these substances. Many start using them in the paediatric age. Some will only experiment with them, but others will consume them regularly, leading to substance abuse or dependence.[9]

Drug use is particularly deleterious at younger ages, when the body (and especially the brain) is still developing and maturing, posing significant risks to physical and mental health. The burden of disease, suffering, and mortality that affects not only the user, but also those around him, is clear, although at times adolescents are not aware of the consequences.

As primary care (PC) professionals who interact with young adults, adolescents, and their families, we are in a privileged position to engage in the prevention, early identification, and treatment of substance use.[10,11] The working group of the PAPPS recommends the periodic assessment and documentation in the clinical history of the use of alcohol, tobacco, and other drugs, at least once a year.[12]

This article presents the results of a study of health-related habits and behaviours of a sample of students aged 13 to 18 years in the province of Valladolid (Spain), which collected data on the use of alcohol, tobacco, and other substances. Our aim was to find out the magnitude and patterns of drug and alcohol use of local adolescents to aid the development of measures and strategies addressing this risk behaviour, and to analyse the sociodemographic variables and risk factors associated with substance use..

MATERIALS AND METHODS

Reference population

The reference population were secondary school students aged 13 to 18 years enrolled in schools in years 2, 3, and 4 of compulsory secondary education (Enseñanza Secundaria Obligatoria [ESO]), and years 1 and 2 of postcompulsory secondary education (Bachillerato LOGSE). The total number of students, 18 888, was calculated using listings obtained from the Consejería de Educación (Department of Education), the Federación Española de Religiosos de la Enseñanza (Spanish Federation of Religious Educators [FERE]), and directly from private schools in Valladolid.

The exclusion criteria within the 13 to 18 year age group were: students enrolled in elementary school, college, or vocational school; students who were absent from school on the day and time that the questionnaire was administered; students of Enseñanzas de Régimen General (regular official curriculum) enrolled in special education programmes and in distance programmes; students attending night school; and students enrolled in Enseñanzas de Régimen Especial (special arts and athletics curriculums).

Sample

We calculated the sample size for an estimated proportion of 50% and a precision of 2.5% for a two-tailed test, and an estimated non-response rate of 10%, which was 1566 students. The total number of students in the final sample amply exceeded this figure, as it amounted to 2412 adolescents, aged 13 to 18 years and enrolled in second-

ary education programmes, after eliminating incomplete responses.

We selected the students by two-stage cluster sampling, randomly selecting schools (n = 14) in the first stage, and classrooms in the second. All students in each of the selected classrooms were included in the sample.

Fieldwork and questionnaire

We used a standardised, anonymous questionnaire comprising 101 items, similar to others used in international,[6] national,[8] and regional (autonomous community or province-level) studies.[13-17]

We collected data for items pertaining to alcohol, tobacco, and drug use; sociodemographic variables; academic achievement; leisure time and activities; accidents; behaviours; interpersonal relationships and experiences of abuse; nutrition, and sexual activity.

The questionnaire was anonymous, voluntary, and individual, and was administered during regular school hours. It was computer-based in 69% of responses, and paper-based in the remaining 31%. The time spent completing the questionnaires ranged from 35 to 40 minutes.

The research team was in charge of administering the survey, at times aided by the teaching staff. All questionnaires were administered between March and May of 2012.

The study design was approved by the research committee of the primary care administration of the western district of Valladolid, Spain.

Statistical analysis

Quantitative variables are expressed as mean values and 95% confidence intervals, and qualitative variables as distributions of frequencies.

We used Pearson's chi-squared test to analyse the association between alcohol consumption, sociodemographic characteristics, and risk factors. When there were 20% or more cells with expected values below 5, we used Fisher's exact test or the likelihood ratio test for variables with more than two categories.

The data were analysed using the statistical software SPSS® version 19.0 for Windows®. We set the statistical significance at $P < .05$.

RESULTS

Our study of students aged 13 to 18 years in the province of Valladolid (Spain) in year 2012 showed that the drugs used most frequently by students aged 14 to 18 years were tobacco, cannabis, and sedatives.

At some point in their lives, 77.2% of the students had used alcohol; 36.7%, tobacco; 17%, cannabis; 2.5%, prescription sedatives; 1.9%, speed or amphetamines; 1.3% non-prescription sedatives; 1.1%, ecstasy; 1%, cocaine; and 0.7%, volatile inhalants (**Figure 1**).

In the past 30 days, 64% had used alcohol; 20.3% had used tobacco; and 6.26% had used other substances.

Polydrug use

In our survey, 22% of the youth aged 13 to 18 years had not used any drugs at any time; 39.7% had used only one type of substance; 23.3%, two types; 11.1%, three; and the rest, 3 or more.

Alcohol was consumed by most of the polydrug users (> 90%) (**Table 1**).

In students who used three substances, the most to least frequently used were alcohol, tobacco, and cannabis (10.7%).

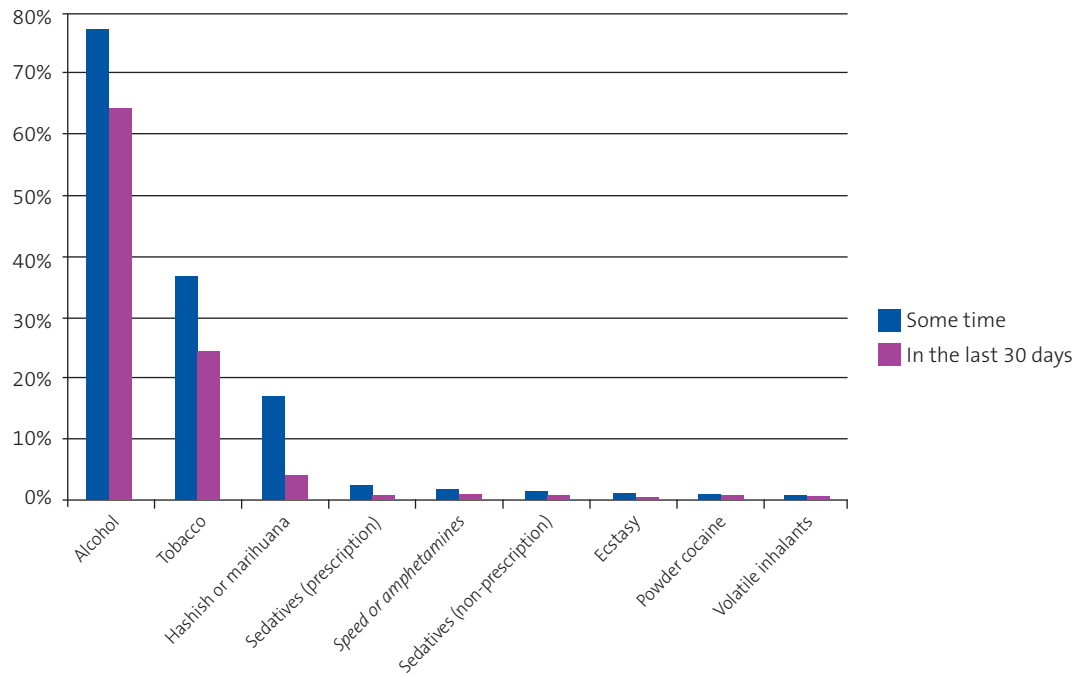
In those who used four substances, the most to least frequently used were alcohol, tobacco, cannabis, and prescription sedatives (1%).

The use of illegal drugs was usually associated to alcohol and tobacco use.

Mean age at first use

On average, the first use of alcohol and tobacco took place between 13 and 14 years of age. The first use of illegal drugs occurred between 15 and 16 years of age. We found that by 12 years of age

Figure 1. Percentage of students that used a given drug some time in their lives and in the last 30 days



18.95% of students had tried alcohol; 9.58 % had tried tobacco; and 1.78% had tried other drugs.

We also observed that polydrug use increased with age, with the use of three or more substances peaking in year 2 of the Bachillerato (Figure 2).

Differences between sexes

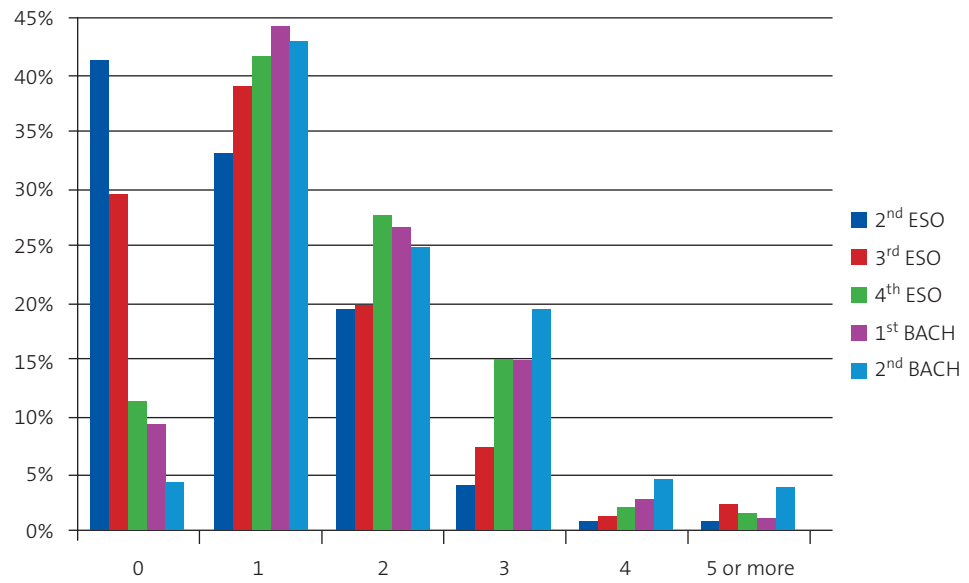
Alcohol use was more prevalent in girls (78.9% of girls vs 75.6% of boys) as was tobacco use (39.7% of girls vs 34% of boys). However, it was the boys who used other types of substances most frequently (20.5% of boys vs 14.7% of girls). The differences in the use of cannabis and of prescription and non-prescription sedatives or sleeping pills were not statistically significant, while the greater prevalence in the use of other substances by male students reached statistical significance.

Heavy use of alcohol, cigarettes, and "joints" was more prevalent in boys. When it came to polydrug use, the use of two or more substances was more prevalent in girls, but the use of three or more substances was more prevalent in boys (Figure 3).

Table 1. Prevalence of polydrug use in 2412 adolescents from Valladolid, 2012

	Frequency	Percentage
Have not used any substances	531	22%
Only alcohol	943	39.1%
Tobacco and alcohol	509	21.1%
Alcohol, tobacco, and hashish or marihuana	258	10.7%
Alcohol and hashish	44	1.8%
Tobacco, alcohol, hashish, and prescription sedatives	23	1%
Only tobacco	15	0.6%
Tobacco, alcohol, hashish and amphetamines	13	0.5%

Figure 2. Proportion of students who have engaged in polydrug use some time, by school year



We did not find any differences in the age at first use or pattern of use between the sexes.

Pattern of use

Daily drug use was infrequent among the students, with only 2.1% using alcohol and 10.4% tobacco on a daily basis. Four percent of the students reported having used cannabis in the past 30 days.

Substance use concentrated on the weekends, mostly at night, in the company of peers and in spaces of leisure (streets, bars, pubs, or dance clubs). Of all respondents, 30.8% reported participating in what is known in Spain as "botellón" (group consumption of store-bought alcohol in public spaces).

The prevalence of alcohol intoxication among those who used alcohol in the period under study was 64%.

Risk perception

The perceived risk of illegal drug use was quite high. About 97% of respondents perceived the use of cocaine, speed or amphetamines, and ecstasy as risky or very risky; 79% had the same level of perception for the use of marihuana or hashish, or non-prescription sedatives; and 24% for sedatives or sleeping pills.

Drug awareness

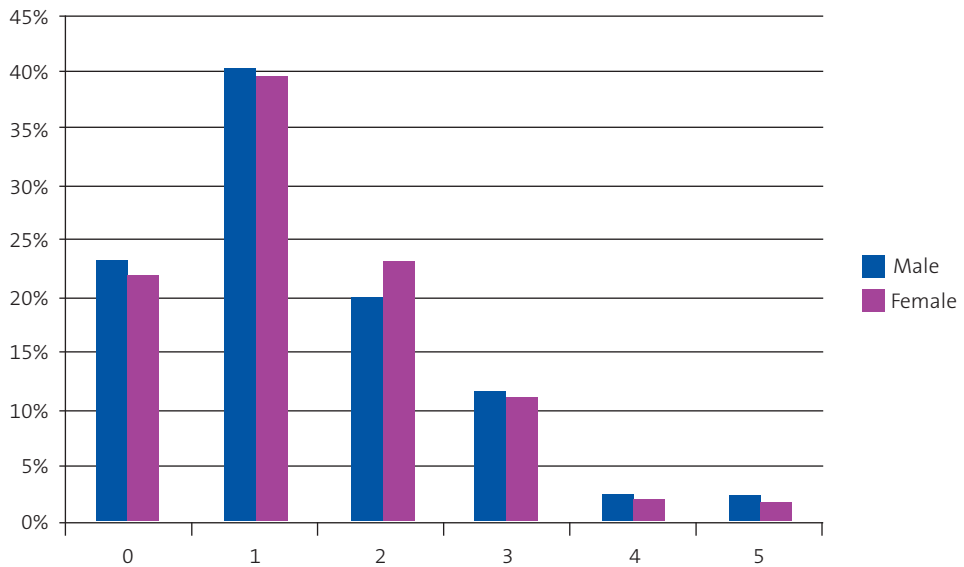
Of all respondents, 89% reported believing that he or she had received enough information about drugs. The proportion was higher in males.

Associated factors

The factors that influence the habits of drinking, smoking, and taking drugs are presented in **Table 2.**

When it came to risk behaviours associated with alcohol use in the past 12 months, 20.4% of students reported having been a passenger in vehicles driven by an individual under the influence of alcohol or drugs; and 8.3% reported having driven a vehicle (car or motorcycle) under the influence of alcohol or drugs. Another 16.6% reported having

Figure 3. Proportion of students that have engaged in polydrug use some time, by sex



experienced some negative consequence of substance use (involvement in arguments, fights, or accidents, or poor academic achievement).

DISCUSSION

Although valuable data is available on the use of addictive substances by adolescents at the national, European, and worldwide level, it is always important that local data are known so they can be interpreted in their specific context and used in developing strategies adapted to the ever-changing landscape of substance use.

Alcohol is clearly the substance used most commonly by adolescents in our province. Comparing alcohol use in our sample to alcohol use in the ESPAD 2011 study,[5] which had a reference population of students from 36 European countries, we found a high level of alcohol use in our setting. Compared to the results of the 2010 ESTUDES nationwide study[8] in a similar population, our sample showed an increase in alcohol use (75.1% ESTUDES vs 77. 2% Valladolid) and a sustained decrease in tobacco use (38.2% vs 36.7%), a trend that has been observed since 2006 and is probably related to the regulatory measures that have been implemented in Spain. A decrease was also observed in the use of the remaining substances, especially in the use of cannabis (33% ESTUDES vs 17% Valladolid), prescription sedatives (18% vs 2.5%), non-prescription sedatives (10.4 vs 1.3%), and cocaine (3.4% vs 1%), which may be attributed to the following circumstances, among others: first, that the age minimum for our population was 1 year younger than the population of the ESTUDES study (14 to 18 years in ESTUDES vs 13 to18 years in Valladolid) and perhaps the younger students had not been introduced to substance use yet; second, that the ESTUDES study included vocational school students, excluded in our study, who may be at higher risk of substance use; third, that we may be observing an emerging trend in substance use, as the most recent national data available today is from 2010; fourth, to potential differences between Valladolid and the rest of Spain in social determinants associated with leisure activities and spaces (inland vs coastal prov-

Table 2. Factors that influence the habits of drinking, smoking, and using other drugs in adolescents

	OR	*p*	95% CI
Alcohol			
Sex: female vs male	0.91	0.05	0.75-1.10
Age: 2nd Bachillerato vs 2nd ESO	4.98	<0.001	3.45-7.17
Household socioeconomic status: low vs high	1.03	0.863	0.84-1.25
Grades below class average: yes vs no	1.19	<0.001	0.94-1.51
Returns home after 1 am: yes vs no	1.73	<0.001	1.32-2.28
Sexual intercourse: yes vs no	3.69	<0.001	3.02-4.51
Stealing frequently: yes vs no	2.57	0.002	1.65-4.01
Have you ever smoked?: yes vs no	1.69	<0.001	1.30-2.18
Have you ever used drugs?: yes vs no	2.22	<0.001	1.65-2.99
Do your friends drink alcohol?: almost all or some vs none	6.09	<0.001	4.45-8.33
Tobacco			
Sex: female vs male	1.30	0.005	1.08-1.57
Age: 2nd Bachillerato vs 2nd ESO	2.54	<0.001	1.83-3.52
Household socioeconomic status: low vs high	1.99	0.003	1.32-2.99
Grades below class average: yes vs no	2.13	<0.001	1.69-2.67
Returns home after 1 am: yes vs no	2.99	<0.001	2.26-3.96
Sexual intercourse: yes vs no	5.58	<0.001	4.57-6.83
Stealing frequently: yes vs no	3.47	<0.001	2.29-5.26
Have you ever had alcohol?: yes vs no	1.29	0.622	0.47-3.56
Intoxicated more than twice: yes vs no	3.84	<0.001	3.12-4.72
Have you ever used drugs?: yes vs no	16.15	<0.001	12.61-20.7
Do your friends smoke cigarettes?: almost all or some vs none	4.12	<0.001	3.00-5.66
Drugs			
Sex: female vs male	1.46	<0.001	1.18-1.81
Age: 2nd Bachillerato vs 2nd ESO	6.88	<0.001	4.54-10.44
Household socioeconomic status: low vs high	1.78	0.012	1.13-2.80
Grades below class average: yes vs no	2.19	<0.001	1.71-2.81
Returns home after 1 am: yes vs no	3.76	<0.001	2.98-4.73
Sexual intercourse: yes vs no	5.82	<0.001	4.64-7.31
Stealing frequently: yes vs no	3.87	<0.001	2.53-5.91
Have you ever had alcohol?: yes vs no	16.7	<0.001	8.58-32.63
Intoxicated more than twice: yes vs no	6.03	<0.001	4.74-7.77
Have you ever smoked?: yes vs no	18.46	<0.001	13.63-24.99
Do your friends use drugs?: almost all or some vs none	7.38	<0.001	4.72-11.56

CI: confidence interval; **ESO:** Compulsory secondary education; **OR:** odds ratio.

inces); and, last of all, the effectiveness of the preventive measures developed and coordinated by public local administrations.

Students that use drugs tend to use more than one type of substance. Polydrug use is an increasingly common pattern of use. The World Health Organization defines polydrug abuse as the consumption of more than one psychoactive drug or drug class at the same time, simultaneously or not, with dependence upon at least one. Thus, determining the difference between polydrug use and polydrug abuse is complicated, as adolescents are usually recent or sporadic users who have not developed dependence yet. At any rate, polydrug use is practised to enhance or balance the effects of different drugs, or simply to have new experiences, but it clearly increases the risks and health and social problems associated to drug use, and makes treatment more difficult.[18] It is important that this pattern is identified to guide interventions. In our study, 38.3% of adolescents had used two or more substances, versus 39.7% that had only ever used one substance. It is also worth noting that 22% of youth aged 13 to 18 years had not

ever used any substances. When we analysed the combination of substances, the most frequent pattern we found was polydrug use of alcohol, tobacco, and cannabis. Psychostimulant drugs (ecstasy, amphetamines, cocaine...), with low percentages of use, were associated with use of other drugs, which suggests that they are occasional use drugs, "added" as secondary or supplemental to other substances, and not used as the primary drug, that is, they are consumed only when other substances are already being used.

In our study and in Spain in general, we observe a stable pattern in the mean ages at first use for these substances, very young at first use of alcohol and tobacco, with first use of other substances occurring a year later.[8] For this reason, we believe that early detection of substance use is important to prevent the progression to polydrug use with consumption of drugs that are considered more dangerous.

We did not observe any differences between the sexes in the age at first use or the pattern of use, which has been fairly constant in both sexes in recent years. At present, in Spain, and in both sexes, drugs are associated with the culture of leisure, and their use is concentrated on the weekends, and at night in particular, as opposed to what occurred in the 1980s, when drug use was associated with marginalisation and crime.[19] This does not make it any safer, as the problems related to drug use persist through the week, and heavy consumption of substances over a short period of time has its own associated risks (neurologic damage, accidents, unprotected sex, violence, etc.)[20]

Although the extent of alcohol consumption has remained stable over time, there is an increased tendency towards heavier use among drinkers (intoxication and binge drinking.)[21] Males show the highest rate of alcohol, tobacco, joints, and polydrug (of three or more substances) use. This is part of the reason why it is important to address the subject of drugs differently in men and women.

Overall, it has been demonstrated that the perceived risk of using these substances is associated with current and future trends in their use. The ESTUDES nationwide study showed that the perceived risk of alcohol use is among the lowest, and that the perceived risk of tobacco use is increasing, with the percentage of adolescents that find it risky exceeding 90% in year 2010. In our study, the perceived risk of using illegal drugs was quite high, which would account in part for the lower proportion of illegal drug use reported in comparison to other studies.

The association of alcohol and other drug use with morbidity and mortality in traffic accidents and with other problems is common knowledge.[22,23] These risks are evinced by the figures in our study—20.3% of adolescents had been passengers in vehicles driven by someone under the influence of alcohol or other drugs, 8.3% had driven a vehicle (car or motorcycle) under the influence of alcohol or other drugs, and 16.6% reported negative consequences of substance use—with proportions similar to those found in other surveys.[8]

Our results show once more the asssociation of risk habits in adolescents: drinking alcohol, smoking, using drugs, having sexual intercourse, and stealing, especially as the respondents get older. We found a strong correlation between smoking and using other drugs. Poor academic achievement and getting back home after 1 a.m. were factors associated to greater use of addictive substances, indicating that they need to be controlled more carefully. Socioeconomic status had a different impact on different risk behaviours, with low socioeconomic status significantly correlating to smoking and use of other substances, but not to alcohol use. The factor that showed the strongest association with the use of all these addictive substances was the use of these substances by the peer group. These findings confirm that substance use is a social and cultural issue associated to environmental, rather than economic, factors.[24,25]

Conclusions

Many adolescents start using drugs in the paediatric age, a stage of physical and psychological maturation, with significant risks to their health. There

is much the PC paediatrician can do in the prevention, diagnosis, and treatment of substance use. Systematic methodologies must be put in place to address these risk behaviours in PC clinics. It is crucial that the medical history include detailed documentation of how the habit started, the pattern of use, and an assessment of problematic substance use and the degree of dependence. Addressing substance use requires specific training and collaboration with substance use treatment centres, mental health services, and community resources. To achieve this, we need to obtain up-to-date information on any ongoing prevention programmes and the community resources available for treatment and social rehabilitation that are implemented in each autonomous community.

CONFLICTS OF INTEREST

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ACRONYMS

ESO: Enseñanza Secundaria Obligatoria (Compulsory Secondary Education) • **FERE**: Federación Española de Religiosos de la Enseñanza (Spanish Federation of Religious Educators) • **HCC:** health care centre • **PC:** Primary Care.

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