Rev Saúde Pública

Carla Neto

Sílvia Fraga

Elisabete Ramos

Illicit substance use by Portuguese adolescents

ABSTRACT

OBJECTIVE: To describe the prevalence of illicit drug consumption among adolescents and the motives that led these adolescents to try them.

METHODS: Cross-sectional study with 2,499 adolescents aged 17 years, based on a cohort called EPITeen, which was started in 2003/2004 with adolescents born in 1990 who studied in public and private schools of the city of Porto, Portugal. A new assessment was carried out in 2007/2008: 1,716 adolescents (79.5%) were recovered and 783 new participants were evaluated. Information about social and demographic characteristics, family and personal history of diseases and behaviours were obtained through self-administered structured questionnaires. The chi-square test was used to test the associations. The statistical analysis was performed in the program SPSS® version 17.

RESULTS: Of the adolescents, 14.6% had tried drugs at least once in their lives. The most tried illicit drug was *cannabis* (12.5%), followed by alcohol together with *cannabis* (5.5%), and tranquilizers (1.7%). The most cited reason for trying drugs was curiosity (77.5%). Friends were the most frequently cited form of obtaining drugs and the school was seen by 24.2% of the adolescents as a place where it was possible to buy *cannabis*.

CONCLUSIONS: The results support the need to intervene at an early age and suggest that this intervention should be integrated with strategies targeted at other risk behaviors, particularly in schools.

DESCRIPTORS: Adolescent. Substance-Related Disorders, epidemiology. Adolescent. Behavior. Cross-Sectional Studies.

INTRODUCTION

According to the World Health Organization (WHO), 4.8% of the world population aged between 15 and 64 years used illicit drugs at least once in the 12 months that preceded the assessment in 2005/2006, which corresponds to 200 million people.[a]

Despite the severity of the utilization of these substances, its impact on mortality and morbidity is lower than the estimates for alcohol and tobacco (the most consumed illicit drugs) and with higher number of users.[a] According to the WHO, 0.4% of the deaths (0.2 million) and 0.8% of the Disability Adjusted Life Years (DALYs) were attributable to illicit drug use in 2000. These values are lower than those attributed to tobacco (8.8% of mortality and 4.1% of the DALYs) and alcohol (3.2% of mortality and 4.0% of the DALYs).[b]

Instituto de Saúde Pública, Universidade do Porto, Porto, Portugal

Correspondence:
Elisabete Ramos
Departamento de Epidemiologia Clínica, Medicina Preditiva e Saúde Pública
Alameda Prof. Hernani Monteiro
4250-319 Porto, Portugal
E-mail: eliramos@med.up.pt

Received: 2/2/2011
Approved: 19/3/2012

Article available from: www.scielo.br/rsp

[a] United Nations, Office on Drugs and Crime. World Drug Report 2007. Geneva; 2007 [cited 2008 Mar 13]. Available from: http://www.unodc.org/unodc/en/data-and-analysis/WDR-2007.html
[b] World Health Organization. Other psychoactive substances. Geneva; 2008 [cited 2008 Mar 13]. Available from: http://www.who.int/substance_abuse/facts/psychoactives/en/index.html

Although the magnitude of the effect is lower than that of tobacco and alcohol, the WHO estimates that 0.6% of the population have problems associated with illicit drug use.[a] The main causes of premature death and morbidity associated with drug consumption are overdose, HIV/Aids infection, infection by hepatitis B and C, suicide and trauma (homicides, road accidents and other accidental deaths).[6] Although road accidents are the main cause of death of adolescents aged 15 to 19 years, followed by suicide and violence,[c] the data tend to underestimate the relationship between proportion of accidents and drug consumption. Studies have shown the association between drug consumption, violence, road accidents and depression.[3,12] The early use of drugs, mainly *cannabis*, is associated with higher probability of consumption of other drugs in the future[10] and with the development of dependence. In addition, it predicts late-onset psychiatric problems, increasing the risk of psychotic problems in vulnerable individuals.[2,11]

Drug use in adolescence is also associated with reduction in the level of schooling, a factor that may limit the opportunities of individual development with repercussions throughout life.[5]

Knowing the prevalence of drug consumption in this phase and the motives for and forms of access to consumption becomes extremely relevant to the planning of measures that aim at reducing the risk associated with drug consumption, as the onset of consumption of these substances usually occurs in adolescence.[8]

This study aimed to describe the prevalence of illicit drug consumption among adolescents and the motives that led these adolescents to try them.

METHODS

Cross-sectional study based on the cohort called EPITeen, which was started in 2003/2004[7] with the assessment of the adolescents born in 1990 and enrolled in public and private schools of the city of Porto. A new assessment was carried out in 2007/2008 and all the schools of Porto in which we expected to find students born in 1990 were contacted. Overall, 2,499 adolescents born in 1990 participated, of whom 1,716 had been assessed in 2003/2004, which corresponds to a 79.4% recovery. The other 783 were evaluated for the first time.

Information about social and demographic characteristics, parents' and the adolescent's history of diseases and behaviours were obtained through self-administered structured questionnaires. The information on illicit drug consumption was collected only at the age of 17.

A list of drug names was provided and the adolescents answered if they had ever heard about each one of them. The list included: amphetamines, cocaine, tranquilizers, marijuana, LSD, heroin, hashish, ecstasy, crack and hallucinogenic mushrooms. The same procedure was used to evaluate which was the first drug that had been used, and in this case it was possible to choose one option. To indicate which drugs had already been tried, the following ones were included: alcohol and *cannabis*, alcohol and tablets, steroids and injected drugs (without mentioning the type of drug), even if it was not the first drug. In all the questions they were asked to add another substance that was not on the list.

A closed question was used to each one of the evaluated substances to quantify the frequency of utilization throughout life¸ in the 12 previous months and in the 30 previous days, with the following options of answer: 0, 1 to 2, 3 to 5, 6 to 9, 10 to 19, 20 to 39 and 40 or more times.

Information on how they had access to the substances, the reason why they tried them and the place where they could easily buy *cannabis* were obtained with closed questions in which more than one option could be chosen and there was the possibility of adding options.

Of the 2,499 adolescents evaluated in 2007/2008, 17 were excluded because they were cognitively or physically incapable of fulfilling the questionnaire and 17 because they had not answered the questionnaire about drug knowledge and consumption. The final sample was composed of 2,465 adolescents, 1,268 of the female sex (51.4%); twenty-three adolescents (six girls and 17 boys) answered the questions about knowledge but did not provide information on drug consumption. Thus, 2,442 adolescents were considered (97.7%) for the analysis of the behaviors.

The chi-square test was used to test the associations. The statistical analysis was performed in the program SPSS® version 17.

The project was approved by the Ethics Committee of *Hospital de S. João* in 2003.

RESULTS

Of the adolescents, 72% lived with both parents; 41% had failed some school grade; 45% smoked or had smoked previously; 84% tried alcoholic beverages; 49% initiated one of these consumptions before the age of 13; 25% had already got drunk; 41% had at least one smoking parent.

The drugs about which more adolescents reported they had heard were cocaine (92.2%), heroin (91.8%),

[c] World Health Organization. World report on violence and health. Geneva; 2002 [cited 2009 May 27]. Available from: http://www.who.int/violence_injury_prevention/violence/world_report/en/full_en.pdf

hashish (90.0%), ecstasy (88.4%) and marijuana (86.8%); 2.2% of the adolescents reported they knew another drug besides those specified in the questionnaire. Male adolescents stated more frequently that they had heard about the listed drugs, except for tranquilizers (83.9% in the female sex versus 79.3% in the male sex, p = 0.004) and cocaine (94.4% in the female sex versus 92.9% in the male sex, p = 0.023). The difference was higher for LSD (43.8% in the female sex versus 57.1% in the male sex, p < 0.001), crack (50.6% in the female sex versus 69.8% in the male sex, p < 0.001) and magic mushrooms (49.6% in the female sex versus 60.5% in the male sex, p < 0.001).

Among the assessed adolescents, 14.6% (n=356) reported they had tried drugs at least once in their lives, with a significantly higher proportion in the male sex (16.5%) compared to the female sex (12.8%), p = 0.010. The proportion of adolescents who reported to have tried some drug was 14.0% among the adolescents aged 16 years and 15.6% among those aged 17 to 18 years (p = 0.315). Forty-nine adolescents had turned 18 by the assessment date and, among them, 22.4% reported they had tried some drug; the difference was not statistically significant when compared to adolescents aged 16 and 17 (p = 0.211). No statistically significant differences were observed according to age with stratification by sex.

Independently of having tried drugs or not, 13.4% of the adolescents reported they had wanted to try drugs, with no statistically significant differences according to sex (12.9% in the female sex, 14.6% in the male sex, p = 0.238). Among the adolescents who reported that they had wanted to try drugs some time in their lives, 81.4% were girls and 84.6% were boys.

Of the 356 adolescents who said they had tried some drug, 20 (six girls and 14 boys) did not inform which was the first drug they used. Among the 336 that provided the information, *cannabis* was the first drug for 88.7% (251 referred to it as hashish and 47 as marijuana). No one referred LSD, ecstasy, heroin or the magic mushrooms as the first drug. Approximately 5.4% reported that the first drug was not on the list and did not specify the drug that was used. The pattern was similar in both sexes (Table 1).

The most cited reason for trying drugs was curiosity (77.5%), followed by wanting to feel stoned (30.9%). Of the 110 who reported wanting to feel stoned, 85 also mentioned curiosity and 25 mentioned wanting to feel stoned as the only reason for trying. The other reasons were presented by less than 10% of the adolescents; 2.2% reported they had consumed drugs because they did not want to feel out of the group (Table 2).

The illicit drug with highest prevalence of consumption throughout life was *cannabis* (12.5%), followed by alcohol together with *cannabis* (5.5%) (Table 3).

The majority of the indicated forms of obtaining drugs were related to friends. “Sharing among groups of

Table 1. First drugs used by the studied adolescents, according to sex. Porto, 2007.

Type of drug	Total		Female adolescents		Male adolescents	
	n	%	n	%	n	%
Amphetamines	2	0.6	1	0.6	1	0.6
Cocaine	1	0.3	1	0.6	0	0.0
Crack	1	0.3	1	0.6	0	0.0
Hashish	251	74.7	117	75.5	134	74.0
Marijuana	47	14.0	17	11.0	30	16.6
Tranquilizers	15	4.5	7	4.5	8	4.4
Others	19	5.6	11	7.1	8	4.4

Table 2. Reasons for trying drugs reported by the studied adolescents, according to sex. Porto, 2007.

Reason	Total		Female adolescents		Male adolescents	
	n	%	n	%	n	%
I was curious	276	77.5	131	81.4	145	74.4
I didn’t want to feel out of the group	8	2.2	1	0.6	7	3.6
I had nothing to do	22	6.2	9	5.6	13	6.7
I don’t remember	20	5.6	11	6.8	9	4.6
I wanted to forget my problems	32	9.0	17	10.6	15	7.7
I wanted to feel stoned	110	30.9	39	24.2	71	36.4
Other reason	13	3.7	8	5.0	5	2.6

Table 3. Number and percentage of studied adolescents, according to type of drug, consumed some time in life. Porto, 2007.

Type of drug	Total (n = 2,442)		Of those who consumed (n = 356)		Without information
	n	%	n	%	n
Alcohol and *cannabis*	134	5.5	134	37.6	33
Alcohol and tablets	32	1.3	32	9.0	41
Amphetamines	14	0.6	14	3.9	41
Cannabis	305	12.5	305	85.7	11
Cocaine	9	0.4	9	2.5	42
Magic mushrooms	13	0.5	13	3.7	40
Crack	6	0.2	6	1.7	40
Injected drugs	2	0.1	2	0.6	42
Ecstasy	19	0.8	19	5.3	40
Steroids	6	0.2	6	1.7	43
Smoked heroin	19	0.8	19	5.3	38
Non-smoked heroin	3	0.1	3	0.8	41
LSD	10	0.4	10	2.8	42
Tranquilizers	41	1.7	41	11.5	36

Table 4. Number and percentage of studied adolescents according to the form of obtaining drugs. Porto, 2007.

Form of obtainig drugs	Total		Female adolescents		Male adolescents	
	n	%	n	%	n	%
Sharing among groups of friends	123	39.5	69	50.0	54	31.2
Given by an older friend	68	21.9	32	23.2	36	20.8
Given by a friend of the same age or by a younger friend	50	16.1	14	10.1	36	20.8
Bought from a friend	27	8.7	8	5.8	19	11.0
Given by an elder brother	6	1.9	2	1.4	4	2.3
Bought from someone he heard about but is not acquainted with	6	1.9	2	1.4	4	2.3
Given by parents	5	1.6	3	2.2	2	1.2
Bought from a stranger	4	1.3	0	0.0	4	2.3
Given by someone he heard about but is not acquainted with	3	1.0	1	0.7	2	1.2
I took it from my house without my parents' permission	3	1.0	3	2.2	0	0.0
Given by a stranger	0	0.0	0	0.0	0	0.0
None of the situations	14	5.1	3	2.9	11	6.9

friends" was the most reported situation, followed by "given by an older friend", "given by a friend of the same age or by a younger friend" and "bought from a friend" (Table 4). Fourteen adolescents reported a situation that was not possible to classify into any of the existing categories ("given by the boyfriend", "found it" and "bought from someone", but without specifying from whom.

Five adolescents mentioned drug given by parents: three informed tranquilizers without medical prescriptions and described in the context of a disease (for example, asthma crisis), and two said that the consumed drug was hashish. The three adolescents who reported that they took drugs out of their parents' house without permission described the use of tranquilizers.

A more detailed analysis was performed of *cannabis* consumption, as this is the illicit drug that was most tried by the adolescents. The proportion of male adolescents who reported that they consumed *cannabis* was significantly higher compared to that of female adolescents (14.2% versus 10.9%, p = 0.010). Considering only the adolescents that reported that they tried drugs at least once in their lives, the proportion was similar in both sexes (85.7% in the female sex and 85.6% in the male sex, p = 0.320).

Considering only the adolescents who consumed drugs, approximately 69.3% of the female adolescents and 70.7% of the male adolescents reported having consumed *cannabis* in the 12 previous months; 45.5% and 43.5%, respectively of the male sex and female

Table 5. Frequency of *cannabis* consumption by the studied adolescents throughout their lives (TL), in the 12 previous months and in the 30 previous days, according to sex. Porto, 2007.

Cannabis Consumption	n*	None		1-2 times		3-5 times		6-39 times		40 times or more	
		n	%	n	%	n	%	n	%	n	%
Female adolescents											
Cannabis (TL)	144	29	20.1	43	29.9	24	16.7	32	22.5	16	11.1
Cannabis (12 months)	140	43	30.7	42	30.0	19	13.2	28	20.0	8	5.8
Cannabis (30 days)	132	72	54.5	41	31.1	7	5.3	6	4.6	6	4.5
Male adolescents											
Cannabis (TL)	179	22	12.3	52	29.1	19	10.6	44	24.5	42	23.5
Cannabis (12 months)	167	49	29.3	40	24.0	12	7.2	37	22.2	29	17.4
Cannabis (30 days)	168	95	56.5	26	15.5	9	5.4	24	14.4	14	8.3

*Among the interviewees who reported illicit drug consumption, 17 female adolescents and 16 male adolescents mentioned some consumption of cannabis, but did not quantify the number of times and, because of this, were not considered in this analysis.

Table 6. Number and proportion of studied adolescents according to information of the place where they can buy *cannabis*. Porto, 2007.

Place	Total		Female adolescents		Male adolescents	
	n	%	n	%	n	%
I don't know any place	71	19.9	36	22.4	35	17.9
Street, park	164	46.1	69	42.9	95	48.7
School	86	24.2	37	23.0	49	25.1
Disco or bar	97	27.2	53	32.9	44	22.6
Seller's house	95	26.7	35	21.7	60	30.8
Other	21	5.9	8	5.0	13	6.7

sex, did it in the 30 previous days. Male adolescents presented higher frequency of *cannabis* consumption in any considered period (Table 5).

Approximately 20% of the adolescents reported not knowing any place where they could acquire *cannabis* and half reported they could buy it on the street and/or in the park. The school was mentioned by approximately 25% of the adolescents, a value that is similar to those who referred discos or bars and a seller's house (Table 6).

DISCUSSION

A high proportion of adolescents reports knowing cocaine, heroin, hashish, ecstasy and marijuana; LSD was less known. This probably because *cannabis* (hashish and marijuana) is one of the most consumed drugs and heroin and cocaine are widely mentioned because they represent the greatest economic and personal damages. These results coincide with the values of the European School Survey Project on Alcohol and other Drugs (ESPAD),[d] carried out in 2003 for Portugal and Europe. No information was collected on whether the adolescent knew the characteristics of the drugs; rather, what was collected was if he/she had heard about each one of them.

Approximately 15% of the adolescents reported they had tried drugs at least once in their lives. The values that were found in our study are similar to those of the 2007 ESPAD,[e] but lower than the results found in *Inquérito Nacional ao Consumo de Substâncias Psicoactivas da População Geral* (National Survey on the Consumption of Psychoactive Substances of the General Population), conducted in 2007, specific to the age group 15 to 24 years,[f] and to *Inquérito Nacional em Meio Escolar* (INME – National Survey in the School Environment), carried out in 2006 in secondary

[d] Hibell B, Guttormsson, Ahlström S, Balakireva O, Bjarnason T, Kokkevi A, Krauss L. The ESPAD report 2003: alcohol and other drug use among students in 35 European countries. Stockholm: The European School Survey Project on Alcohol and Other Drugs; 2004 [cited 2009 May 11]. Available from: http://www.sedqa.gov.mt/pdf/information/reports_intl_espad2003.pdf

[e] Hibell B, Guttormsson U, Ahlström S, Balakireva O, Bjarnason T, Kokkevi A, Krauss L. The 2007 ESPAD report: substance use among students in 35 European countries. Stockholm: The European School Survey on Alcohol and other drugs; 2009 [cited 2009 May 11]. Available from: http://www.espad.org/documents/Espad/ESPAD_reports/2007/The_2007_ESPAD_Report-FULL_090325.pdf

[f] CEOS – Investigações Sociológicas da Universidade Nova de Lisboa. II Inquérito Nacional ao Consumo de Substâncias Psicoactivas na População Portuguesa 2007. Lisboa; 2007 [cited 2009 May 11]. Available from: http://www.idt.pt/PT/Investigacao/Documents/Relatorio/INPG07/ParteIII.pdf

education.[g] The differences in the age groups evaluated in the different studies may justify these discrepancies and allow understanding the similarity of our results to those of ESPAD. One year can represent a huge change in the number of adolescents who consume drugs, since adolescence is a period of great changes. Thus, the comparison between studies that include different ages, even when they are close, should be drawn with caution. Although the prevalence of consumption in Europe varies across nations (from 4% to 46%), our study points to a prevalence among Portuguese adolescents that is lower than the European average.[e] Our results agree with those of the Health Behaviour in School-aged Children (HBSC/WHO),[h] conducted in 2006, with those of the 2007 ESPAD and with those of the 2006 INME, supporting the idea of a generalized stability in the consumptions or even some decrease.

Almost all the adolescents who tried drugs mentioned the desire to try. Although it is expected that the adolescents who tried are those who desired to do it, the cross-sectional nature of this study does not enable to exclude the hypothesis that the answer that they wanted to try is conditioned to the fact that they did it. Approximately 15% do 20% of the adolescents never tried drugs but reported that they would like to. It would be important to know the reasons that led them not to try drugs for the planning of preventive measures. However, the questionnaire did not include this information.

Although the prevalence of trying increases with age, in agreement with the literature,[g,h] the difference was not statistically significant. We do not have enough variability in the sample to study the effect of age, as the year of birth is an inclusion criterion. This homogeneity is, however, an advantage, since it provides a more homogeneous sample in the opportunity of drug consumption.

Like in other studies, the proportion of male adolescents that reported having tried some drug is significantly higher than that of female adolescents.[4,e,f,g,h] Nevertheless, there are no differences between sexes regarding the choice of the drug. The differences are statistically significant concerning hallucination mushrooms and steroids. However, given the low number of adolescents who consumed these substances, these differences cannot be evaluated. Although they use the same type of drugs, male adolescents try and consume them with more frequency.

Curiosity was mentioned by the adolescents as the main reason, like in other European studies.[d] Although peer pressure was not much reported by the adolescents as a reason for consumption, friends are referred to as the main source of illicit drugs, which suggests the importance of peers in drug consumption.[1,9]

Cannabis is the most consumed illicit drug by the adolescents and usually the first to be tried, like in previous studies.[e,g,h] The literature mentions many reasons for this choice, namely low price,[i] easy access and the fact that it is perceived as the illicit drug of regular consumption that presents the lowest risk and which is the easiest one to abandon.

This easy access is confirmed in this study. Approximately 25% of the adolescents who reported having already tried drugs mentioned that they can easily buy *cannabis* at school. This datum is important for the implementation of preventive measures that help to reduce the access.

Portugal maintains a prevalence of *cannabis* consumption that is lower than that of the rest of Europe (12.5% compared to the European average of 19%)[e] and, according to recent studies, it tends to decrease or stabilize to the level of the other illicit drugs.[e,h] Four percent of the adolescents reported they consume drugs other than *cannabis*, a value that is similar to the one found in the 2007 ESPAD, although slightly lower (4% compared to 6%).

Risk perception was not evaluated; therefore, it is not possible to know if the low risk perception concerning ecstasy exists, but ecstasy presented low consumption prevalence (0.8%) and was not the first choice for any of the participants. This result, although inferior to the one described in previous studies,[e,h] agrees with the fact that the consumption of ecstasy in school populations has decreased.[e,h] It is difficult to understand the difference between the prevalence of ecstasy consumption compared to that of *cannabis*; after all, it is cheap and considered by students a drug of easy access.[j] The difference in the risk perception between the two substances is a possible justification. Data from *Estudo sobre o Consumo de Tabaco, Álcool e Drogas* (ECTAD – Survey on Tobacco, Alcohol and Drug Consumption), conducted in 2003,[j] show that 20 to 25% of the adolescents consider that *cannabis* consumption has small or no risk; less than 1% reported the same about ecstasy.[j]

These results support the need to intervene at early ages and that this intervention should be integrated with strategies targeted at other risk behaviors, mainly in the school environment.

---

[g] Instituto da Droga e da Toxicodependência. Inquérito Nacional em Meio Escolar (INME) – 2006, resultados definitivos. Lisboa; 2006 [cited 2009 May 13]. Available from: http://www.idt.pt/PT/RevistaToxicodependencias/Artigos%20Ficheiros/2010/1/Text3Vol16_n1E.pdf

[h] World Health Organization, Regional Office for Europe. Inequalities in young people's health. HBSC international report from the 2005/2006 survey. Copenhagen; 2008. (Health Policy for Children and Adolescents, 5.) [cited 2009 Oct 30]. Available from: http://www.euro.who.int/Document/E91416.pdf

[i] Instituto da Droga e da Toxicodependência. Relatório anual 2006: a situação do país em matéria de drogas e toxicodependências. Lisboa; 2007 [cited 2008 Mar 13]. Available from: http://www.idt.pt/PT/IDT/RelatoriosPlanos/Paginas/SituacaodoPais.aspx

[j] Instituto da Droga e da Toxicodependência. Estudo sobre o consumo de álcool, tabaco e droga, em alunos do ensino público – Portugal Continental / 2003 (ECATD / 2003). Lisboa; 2003 [cited 2008 Mar 13]. Available from: http://www.idt.pt/PT/Investigacao/Documents/Folheto/ecatd_Droga.pdf

REFERENCES

1 Agrawal A, Lynskey MT, Bucholz KK, Madden PA, Heath AC. Correlates of cannabis initiation in a longitudinal sample of young women: the importance of peer influences. *Prev Med.* 2007;45(1):31-4. DOI:10.1016/j.ypmed.2007.04.012

2 Brook DW, Brook JS, Zhang C, Cohen P, Whiteman M. Drug use and the risk of major depressive disorder, alcohol dependence, and substance use disorders. *Arch Gen Psychiatry.* 2002;59(11):1039-44.

3 Butters JE, Smart RG, Mann RE, Asbridge M. Illicit drug use, alcohol use and problem drinking among infrequent and frequent road ragers. *Drug Alcohol Depend.* 2005;80(2):169-75. DOI:10.1016/j.drugalcdep.2005.03.018

4 Carlini-Cotrim B, Gazal-Carvalho C, Gouveia N. Comportamentos de saúde entre jovens estudantes das redes pública e privada da área metropolitana do Estado de São Paulo. *Rev Saude Publica*. 2000;34(6):636-45. DOI:10.1590/S0034-89102000000600012

5 Chatterji P. Illicit drug use and educational attainment. *Health Econ*. 2006;15(5):489-511. DOI:10.1002/hec.1085

6 Degenhardt L, Hall W, Warner-Smith M, Lynskey M. Illicit drug use. In: World Health Organization. Comparative quantification of health risks: global and regional burden of disease attributable to selected major risk factors. Geneva; 2004. v.1, chapter 13, p. 1109-75.

7 Fraga S, Ramos E, Barros H. Uso de tabaco por estudantes adolescentes portugueses e fatores associados. *Rev Saude Publica*. 2006;40(4):620-6. DOI:10.1590/S0034-89102006000500010

8 Jessor R. Risk behaviour in adolescence: a psychosocial framework for understanding and action. *J Adolesc Health*. 1991;12(8):597-605.

9 Lundborg P. Having the wrong friends? Peer effects in adolescent substance use. *J Health Econ.* 2006;25(2):214-33. DOI:10.1016/j.jhealeco.2005.02.001

10 Lynskey MT, Vink JM, Boomsma DI. Early onset cannabis use and progression to other drug use in a sample of Dutch twins. *Behav Genet.* 2006;36(2):195-200. DOI:10.1007/s10519-005-9023-x

11 Miller P, Lawrie SM, Hodges A, Clafferty R, Cosway R, Johnstone EC. Genetic liability, illicit drug use, life stress and psychotic symptoms: preliminary findings from the Edinburgh study of people at high risk for schizophrenia. *Soc Psychiatry Psychiatr Epidemiol*. 2001;36(7):338-42. DOI:10.1007/s001270170038

12 Stenbacka M, Stattin H. Adolescent use of illicit drugs and adult offending: a Swedish longitudinal study. *Drug Alcohol Rev.* 2007;26(4):397-403. DOI:10.1080/09595230701373875

Study based on the Master's thesis authored by Carla Sofia Azevedo Barbosa Neto and submitted to the School of Medicine of *Universidade do Porto* in 2010.
The authors state there are no conflicts of interest.