Relation between Substance Use and Depression among Spanish Adolescents

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ABSTRACT

The aim of this study was to analyze the consumption of alcohol, tobacco and cannabis in relation to the existence of depressive symptoms in a school sample of adolescents. The incidental sample (N= 707) was composed by students from 1st to 4th year of high school (mean age= 14 years old). Univariate and multivariate predictive models were established by logistic regression analysis. Depressive symptoms were higher among tobacco users (*OR*= 0.93, 95% *CI* 0.90-0.95), alcohol users (*OR*= 0.94, 95% *CI* 0.92-0.96) and cannabis users (*OR*= 0.95, 95% *CI* 0.92-0.98), without affecting the frequency of consumption. The results suggest the coexistence of factors of substance use and depressive symptoms. High scores in depression are associated with the consumption of tobacco and alcohol but not to cannabis use. For all the evaluated substances, depression is a variable linked to any use but not for the frequency of use. The role of depressive symptoms as a factor related to substance use of and its implications in the development of preventive programs are discussed. *Key words*: adolescence, alcohol, tobacco, cannabis, depression, risk factors.

RESUMEN

El objetivo de este estudio fue analizar el consumo de alcohol, tabaco y cannabis y su relación con los síntomas depresivos en una muestra escolar de adolescentes. La muestra incidental (N= 707) estuvo compuesta por alumnos de 1º a 4º de Secundaria (edad media= 14 años). Se establecieron modelos predictivos univariados y multivariados mediante análisis de regresión logística. Los síntomas depresivos fueron más elevados entre los consumidores de tabaco (*OR*= 0,93, *IC* 95% 0,90-0,95), alcohol (*OR*= 0,94, *IC* 95% 0,92-0,96) y cannabis (*OR* = 0,95, IC 95% 0.92-0.98), sin que afectara la frecuencia de consumo. Los resultados sugieren la coexistencia de factores de consumo de sustancias y los síntomas depresivos. Las puntuaciones altas en depresión están asociadas al consumo de tabaco y alcohol, pero no al consumo de cannabis. En todas las sustancias evaluadas la depresión es una variable relacionada con el consumo, pero no con su frecuencia o intensidad. Se discute el papel de la depresión como variable relacionada con el consumo de sustancias y sus implicaciones en el desarrollo de programas de prevención. *Palabras clave*: adolescentes, alcohol, tabaco, cannabis, depresión, factores de riesgo.

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The availability and social acceptance of alcohol, cannabis and tobacco have contributed to the fact that these substances are the most used among the adolescent population in Spain. Studies on risk factors include affective disorders as a variable that increases the likelihood of substance use (Espada, Méndez, Griffin, & Botvin, 2003; Galaif, Sussman, Chou, & Wills, 2003; Inglés, Delgado, Bautista, *et al.*, 2006).

Substance use has been linked to some kind of emotional distress prior to consumption (Huba, Newcomb, & Bentler, 1986; Kaplan, 1985). In a sample of young Americans, Shedler, and Block (1990) observed that marijuana users had more emotional problems during childhood. In the same vein, in a 5-year longitudinal study of adolescents, Lerner and Vicary (1984) observed the relation between a difficult temperament, including frequent negative moods and social isolation, and the initiation and continuance of substance use. Moods and negative responses to isolation by difficult children could be similar to the depression and social alienation often expressed by substance users (Knight, Sheposh, & Bryson, 1974; Paton & Kandel, 1978; Paton, Kessler, & Kandel, 1977; Smith & Fogg, 1978). Substance use is often used as a method to relieve emotional problems (Aneshensel & Huba, 1983; Labouvie, 1996), although its effects are not very durable or effective in the long term, as consumption tends to enhance depressive symptoms (Bleichmar, 1994; Calafat & Amengual, 1991).

In Spain, Becoña, Lista and Froján (1989) studied the relation between negative moods and relapse in the use of tobacco, noting that 29.4% of relapses were related to experiencing negative emotional states, which is one of the most frequently identified causes (Becoña & Míguez, 1995). Barnea, Teichman, and Rahav (1992) conducted a longitudinal study with 1,446 students between 15 and 19 to analyze the relation between availability of substances and a consumption model incorporating mood variables. It was found that the presence of depression was not statistically significant in participants using alcohol and other substances. This result coincides with those obtained by Schwarz, Burkhart, and Green (1982), and by Lopez and Freixinós (2001) from a Spanish sample. However, other studies have found a significant relation between alcohol or other substance use and high levels of anxiety and depression (eg., Brook, Walfish, Stenmark, & Cange, 1981; Hanna, Yi, Dufour, & Whitmore, 2001; Shedler & Block, 1990).

However, the relation between depressive symptoms and the substance use is not entirely clear, neither is there any clear evidence of whether it is the mental problem or the high risk of substance use which comes first, or whether all substances have the same emotional connection with the problem (Ross, 2004).

Although the data found in previous studies are contradictory, a low level of personal satisfaction prior to consumption is generally observed, which could explain the high incidence of mood disorders and suicide among adolescent users (Crumley, 1990; Kaminer, 1991; Newcomb & Bentler, 1988; Newcomb, Maddahian, & Bentler, 1986; Ruiz, Lozano, & Polaino, 1994; Stowell & Estroff, 1992).

Despite the existence of research that seeks to identify the factors which predispose initiation in substance use and subsequent abuse, the results are very controversial. Furthermore, in order to develop explanatory models for a more complete understanding of the phenomenon, which would lead to the construction of effective prevention programs, there is a need for more studies which focus on the relation between levels

of depression and both substance use in adolescence and frequency of use and also distinguish between legal and illegal substances.

The main objective of this study was to analyze adolescent use of two legal substances, alcohol and tobacco, and an illegal one, cannabis, on the basis of the existence of depressive symptoms in order to determine the predictive capacity of these symptoms in relation to the use of each substance and the quantity consumed. Higher levels of depression were expected to be found among teenagers consuming substances than non-consumers. An additional objective was to study the effect of socio-demographic characteristics on depressive symptoms and substance use, such as gender and age.

Method

Participants

The incidental sample was made up of all the students enrolled in public schools from 1st to 4th grade of Secondary Education in a medium city (Elche, Alicante, Spain). Eight hundred and thirty three students were recruited, 126 cases were excluded due to incomplete data or poor execution. The sample finally consisted of 707 adolescents (365 boys and 342 girls) with ages ranging between 11 and 16 and an average of 14.01 (SD= 1.33). One hundred and eighty-one adolescents (25.6%) were students of 1st grade of Secondary School, 201 (28.4%) of 2nd grade, 167 (23.6%) of 3rd grade, and 158 (22.3%) of 4th grade.

Most of the students (606) lived with both parents. Seventy-seven subjects lived with their father or their mother alone (10.9%) and 24 (3.2%) with other relatives. The majority of them (87%) had two siblings or less. As for academic level, 504 subjects had not repeated any course (71.3%), 173 students had repeated a grade (24.5%) and 3.5% two years.

Instruments

Substance Use Survey. The survey consisted of 10 items for the frequency of tobacco, alcohol or cannabis use during the last month. The choices for the answers were rated from 1 to 4 depending on the frequency of use. Also the onset age for each of the substances was registered.

Child Depression Inventory (CDI, Kovacs & Beck, 1977). This scale comprises 27 items and assesses the main characteristics of depression: dysphoria, anhedonia, psycho-physiological disorders (sleep, fatigue, appetite), self-concept, self-esteem, feelings of guilt, cognitive distortions, indecisiveness and suicidal ideation, as well as its adverse impact on school and social life. Each item has three alternatives ranging from 0 to 2 depending on the severity of symptoms. The total score is calculated by the sum of all the items and varies in a range of scores from 0 to 54. The questionnaire has adequate psychometric properties (Cronbach's alpha between .71 and .94 and test-retest stability between .38 and .87).

Procedure

After informing the heads of schools about the objectives of the study and re-
ceiving parents' informed consent, the questionnaires were administered to the students
in the classroom. Administration took approximately 45 minutes. The subjects were
given homogenous instructions and asked to fill out the questionnaires honestly and
confidentiality of data was ensured. The subjects were not paid for their participation.
A member of the research team remained in the classroom to answer any queries.

Data Analysis

Statistical analysis was carried out using SPSS 15.0. The descriptive analysis
of the results was the mean and standard deviations for the continuous variables and
the range and frequency for the categorical variables. A study was carried out for the
prevalence rates of use: at any time, within the last six months (recent) and within
the last thirty days (frequent use) for each of the substances. User (coded as 0) and
non-user (coded as 1) groups were compared in their ratings of depression and other
demographic variables, conducting a t-test for the quantitative variables and a chi-square
for categorical variables.

The differences between consumers were examined by univariate and multivariate
logistic regression, taking into account the possible interactions of individual forecasters
with the depression variable, and obtaining effect sizes measured as Odds Ratio (*OR*) and
their confidence intervals at 95 % by using Woolf's approximation. Finally, a discrimi-
nation analysis was conducted for frequency of use in relation to levels of depression.

Results

The substance with the highest rates of use in the total sample (*N*= 707) was
alcohol (38.8%) compared to tobacco (21.8%) and cannabis (11.6%). The earliest average
age of onset of consumption corresponded to tobacco, 12.8 years, followed by alcohol,
13.4 years, and cannabis, 13.8 years. The pattern of alcohol use was sporadic, with a
rate of weekly users of 7.7%. In the case of tobacco, weekly or daily percentage of
use was 8.2% and 3.3% respectively. With regard to cannabis use, 3% of them used it
monthly and 3% weekly.

Table 1 describes the effect sizes (*OR*) and the related statistical analysis of each
group in terms of consumption (coded as 0) or non consumption of tobacco (coded as
1). Data relative to frequency are presented in Table 2. The average age of smokers
was significantly higher than that of non-smokers (*OR*= 0.48; *CI* 95% 0.41-0.57, *p*
<.01). Teenagers who smoke were more likely to live with both parents compared with
non-smokers (*OR*= 0.60, *CI* 95% 0.38-0.97, *p* <.01). Regarding gender (female coded
as 0 and male coded as 1), there was a greater likelihood of there being a male among
non-smokers than among smokers (*OR*= 1.46, *CI* 95% 1.02-2.10, *p* <.05). The number

of siblings was not significant when comparing smokers to nonsmokers, the trend was that both groups usually had 1 or 2 siblings (*OR*= 0.48, *CI* 95% 0.22-1-05, *p* >.05).

Smokers had higher scores on the CDI scale than non-smokers (*OR*= 0.93, *CI* 95% 0.90-0.95, *p* <.01). The use of alcohol and cannabis were also associated to tobacco use, (*OR*= 22.72, *CI* 95% 13.40-38.52, *p* <.01 and *OR*= 88.82, *CI* 95% 37.42-210.82, *p* <.01, respectively). When the effect of depression was controlled by the rest of the socio-demographic factors, gender, alcohol use, and coexistence no longer had a significant impact on tobacco use. However, depression, age and cannabis use were still significant in the multivariate model, following the same pattern as they did in the univariate model. The interaction between alcohol and depression scores was also significant in the multivariate model, the participants who smoked had higher scores for depression and usually drank alcohol (*OR*= 0.87, *p* <.01. The model explained 61% of the variance (Nagelkerke R2).

The frequency of tobacco use was affected significantly by age (*τKendall*= .165, *p* <.05), alcohol and cannabis use (χ^2= 8.2, p < .05; χ^2= 28.87, *p* <.01, respectively), and the frequency of consumption. The higher the use of alcohol and cannabis, the higher the use of tobacco (χ^2= 29.74, *p* <.01; χ^2= 76.64, *p* <.01 for alcohol and cannabis, respectively).

The average age of teenagers who drink was significantly higher than for those who did not (*OR*= 0.45, *CI* 95% 0.39-0.52, *p* <.01) (Table 3). Although, gender and coexistence were not significant for alcohol use, the trends were similar to those who smoked. Alcohol drinkers were more likely to live with both parents compared to those who did not (*OR*= 0.95, *CI* 95% 0.62-1.47, *p* <.01) regardless of gender. There was more likely to be a male among non-drinkers than among drinkers, although it was not a significant difference (*OR*= 1.28, *CI* 95% 0.94-1.73, *p* >.05). The number of siblings was not significant either, although it was more usual for them to have between 1 and 2 (*OR*= 0.83, *CI* 95% 0.41-1.65, *p* >.05).

Table 1. Depression and socio-demographic factors in predicting tobacco use.

		Smokers (*N*= 154) *M (SD)*	Non-smokers (*N*= 553) *M (SD)*	*OR*	95% *CI*
Age		14.91 (1.24)	13.76 (1.24)	0.48	0.41-0.57[**]
Depression		13.56 (6.60)	10.45 (6.16)	0.93	0.90-0.95[**]
Gender	Boys	68 (44.2%)	297 (53.7)	1.46	1.02-2.10[*]
	Girls	86 (55.8)	256 (46.3)		
N° siblings	0	17 (11)	36 (6.5)	[a]	
	1 or more	120 (77.9)	442 (79.9)	0.48	0.22-1.05
	3 or more	17 (11)	75 (11)	0.84	0.47-1.47
Coexistence	With both parents	124 (80.5)	482 (87.2)	0.60	0.38-0.97[**]
	With one parent or others	30 (19.5)	71 (12.8)		
Alcohol use	Yes	136 (88.3)	138 (25)	22.72	13.40-38.52[**]
	No	18 (11.7)	415 (75)		
Cannabis use	Yes	76 (49.4)	6 (1.1)		
	No	78 (50.6)	547 (98.9)	88.82	37.42-210.82[**]

[*]*p* <.05; [**]*p* <.01; *N*= sample size; *M*= Mean; *SD*= Standard Deviation; [a] Comparison group; %= Percentage of subjects by columns; *OR*= Odds Ratio; *CI*= Confidence Interval.

Table 2. Depression and socio-demographic factors in the distribution of tobacco use.

Variables		Frequency of tobacco use (Nº of cigarettes)				$\tau_{Kendall}$
		1-2 / month (N = 73)	5-10 / week (N = 39)	10-20 / week (N = 19)	> 10 / day (N = 23)	
		M (SD)	M (SD)	M (SD)	M (SD)	
Age		14.67 (1.33)	14.92 (1.11)	15.32 (1.16)	14.01 (1.06)	0.165[*]
Depression		12.67 (6.33)	15.39 (7.77)	12.58 (4.44)	14.09 (6.44)	0.084
		N (%)	N (%)	N (%)	N (%)	χ^2
Gender	Boys	34 (50)	15 (22.1)	10 (14.7)	9 (13.2)	1.47
	Girls	39 (45.3)	24 (27.9)	9 (10.5)	14 (16.3)	
Nº siblings	0	11 (64.7)	4 (23.5)	0 (0)	2 (11.8)	5.2
	1 or 2	54 (45)	30 (25)	16 (13.3)	20 (16.7)	
	3 or more	8 (47.1)	5 (29.4)	3 (17.6)	1 (5.9)	
Coexistence	With both parents	60 (48.4)	30 (24.2)	15 (12.1)	19 (15.3)	.54
	With others	13 (43.3)	9 (30)	4 (13.3)	4 (13.3)	
Alcohol use	Yes	60 (44.1)	34 (25)	19 (14)	23 (16.9)	8.2[*]
	No	13 (72.2)	5 (27.8)	0 (0)	0 (0)	
Cannabis use	Yes	23 (30.3)	18 (23.7)	16 (21.1)	19 (25)	28.87[**]
	No	50 (64.1)	21 (26.9)	3 (3.8)	4 (5.1)	
Frequency of alcohol use (glasses)	1 / month	39 (63.9)	15 (24.6)	4 (6.6)	3 (4.9)	29.74[**]
	2-3 / month	23 (44.2)	15 (28.8)	7 (13.5)	7 (13.5)	
	1-2 / week	5 (22.7)	8 (36.4)	4 (18.2)	5 (22.7)	
	> 3 / week	6 (31.6)	1 (5.3)	4 (21.1)	8 (42.1)	
Frequency of cannabis use (times)	1 / month	68 (59.6)	29 (25.4)	11 (9.6)	6 (5.3)	76.64[**]
	2-3 / month	5 (25)	5 (25)	7 (35)	3 (15)	
	1-2 / week	0 (0)	1 (12.5)	0 (0)	7 (87.5)	
	> 3 / week	0 (0)	4 (33.3)	1 (8.3)	7 (58.3)	

[*] $p <.05$; [**] $p <.01$; N= sample size; M= Mean; SD= Standard Deviation; $\tau_{Kendall}$= Kendall's tau; %= Percentage of subjects by columns; χ^2= Chi-square.

Table 3. Depression and socio-demographic factors in predicting alcohol use.

		Alcohol users (N= 274)	Alcohol non-users (N= 433)	OR	95% CI
		M (SD)	M (SD)		
Age		14.74 (1.16)	13.54 (1.21)	0.45	0.39-0.52[**]
Depression		12.57 (6.52)	10.20 (6.12)	0.94	0.92-0.96[**]
		N (%)	N (%)		
Gender	Boys	131 (47.8)	234 (54)	1.28	0.94-1.73
	Girls	143 (52.2)	199 (46)		
Nº siblings	0	22 (8)	31 (7.2)	[a]	
	1 or 2	218 (79.6)	344 (79.4)	0.83	0.41-1.65
	3 or more	34 (12.4)	58 (13.4)	0.92	0.59-1.46
Coexistence	Both parents	234 (38.6)	40 (39.6)	0.95	0.62-1.47
	One parent or others	372 (61.3)	61 (60.4)		
Tobacco use	Yes	136 (49.6)	18 (4.2)	22.72	13.30-38.52[**]
	No	138 (50.4)	415 (95.8)		
Cannabis use	Yes	79 (28.8)	3 (0.7)	58.06	18.10-186.20[**]
	No	195 (71.2)	430 (99.3)		

[*] $p <.05$; [**] $p <.01$; N= sample size; M= Mean; SD= Standard Deviation; [a] Comparison group; %= Percentage of subjects by columns; OR= Odds Ratio; CI = Confidence Interval.

Depressive symptoms appeared related to alcohol use significantly, i.e., users tended to score higher in depression than non-users (*OR*= 0.94, *CI* 95% 0.92-0.96, *p* <.01). Alcohol consumption was closely and significantly related to tobacco and cannabis use (*OR*= 22.72, *CI* 95% 13.30-38.52, *p* <.01 and *OR*= 58.06, *CI* 95% 18.10-186.20, *p* <.01, respectively). By integrating all the significant variables in a model all of them were still significant without having any significant interaction with the scores for depression. The model explained 48% of the variance (R2 Nagelkerke).

As shown in Table 4, the frequency of alcohol use was related to age, older subjects had higher tobacco use (*τKendall*= 0.199, *p* <.01), and to the consumption of tobacco (χ^2= 31.85, *p* <.01), and cannabis (χ^2= 48.65, *p* <.01), as well as frequency of use (see Table 4). The higher the use of these two substances, the higher the use of alcohol (χ^2= 51.79, *p* <.01 and χ^2= 59.46, *p* <.01 for tobacco and cannabis, respectively).

Depressive symptoms were also associated with cannabis use, i.e., users tended to score higher on the depression scale than non-users (*OR*= 0.95, *CI* 95%, 0.92-0.98, *p* <.01. The average age of those who consumed was significantly higher than those who did not (*OR*= 0.46, *CI* 95%, 0.37-0.56, *p* <.01). There were no significant relations with gender, coexistence and number of siblings, however, the trends followed the same pattern as they did for smokers and alcohol drinkers. Adolescents who used cannabis were more likely to live with both parents compared with those who did not (*OR*= 0.87, *CI* 95%, 0.46-1.64, *p* >.05). In terms of gender, males were more likely to be among those who used cannabis than among those who did not (*OR*= 1.13, *CI* 95%, 0.71-1.80, *p* >.05), and, finally, they usually had between 1 and 2 siblings (*OR*= 0.96, *CI* 95%,

Table 4. Depression and socio-demographic factors in the distribution of alcohol use.

Variables		Frequency of alcohol use (number of glasses)				$\tau_{Kendall}$
		1 / month (*N*= 132)	2-3 / month (*N*= 86)	1-2 / week (*N*=30)	>3 / week (*N*=26)	
		M (SD)	*M (SD)*	*M (SD)*	*M (SD)*	
Age		14.48 (1.18)	14.89 (1.03)	15.10 (1.21)	15.19 (1.20)	.199**
Depression		12.28 (7.07)	12.35 (5.96)	14 (6.56)	13.19 (5.35)	.082
		N (%)	*N (%)*	*N (%)*	*N (%)*	χ^2
Gender	Boys	65 (49.6)	39 (29.8)	16 (12.2)	11 (8.4)	1.0
	Girls	67 (46.9)	47 (32.9)	14 (9.8)	15 (10.5)	
Nº siblings	0	13 (59.1)	5 (22.7)	2 (9.1)	2 (9.1)	5.68
	1 or 2	104 (47.7)	73 (33.5)	21 (9.6)	20 (9.2)	
	3 or more	15 (44.1)	8 (23.5)	7 (20.6)	4 (11.8)	
Coexistence	With both parents	116 (49.6)	71 (30.3)	26 (11.1)	21 (9)	1.69
	With others	16 (40)	15 (37.5)	4 (10)	5 (12.5)	
Tobacco use	Yes	43(31.6)	52(38.2)	22(16.2)	19(14)	31.85**
	No	89(64.5)	34(24.6)	8(5.8)	7(5.1)	
Cannabis use	Yes	17(21.5)	27(34.2)	17(21.5)	18(22.8)	48.65**
	No	115(59)	59(30.3)	13(6.7)	8(4.1)	
Frequency of tobacco use (cigarettes)	1-2 / month	115(58.1)	57(28.8)	13(6.6)	13(6.6)	51.79**
	5-10 / week	10(29.4)	15(44.1)	8(23.5)	1(2.9)	
	10-20 / week	4(21.1)	7(36.8)	4(21.1)	4(21.1)	
	> 10 / day	3(13)	7(30.4)	5(21.7)	8(34.8)	
Cannabis frequency of use (times)	1 / month	129(55.6)	72(31)	17(7.3)	14(6)	59.46**
	2-3 / month	3(14.3)	7(33.3)	7(33.3)	4(19)	
	1-2 / week	0(0)	3(37.5)	2(25)	3(37.5)	
	> 3 / week	0(0)	4(30.8)	4(30.8)	5(38.5)	

*p <.05; **p <.01; *N*= sample size; *M*= Mean; *SD*= Standard Deviation; $\tau_{Kendall}$= Kendall's tau; %= Percentage of subjects by columns. χ^2= Chi-square.

p >.05). Once again, the use of tobacco and alcohol was significantly related to cannabis use (*OR*= 88.82, *CI* 95% 37.2-210.8, *p* <.01 and *OR*= 58.06, *CI* 95% 18.10-186.2, *p* <.01, respectively). By integrating the four significant variables in a model, the score on the scale of depression becomes a significant factor in predicting cannabis use as well as any interaction of that variable with the other four factors which were included in the model. The model explained 58% of the variance (Nagelkerke R2) (Table 5).

As for the frequency of substance use, the variables that best discriminated between the different groups for the quantity of cannabis used were age -older subjects consume more- ($\tau Kendall$= .218, p <.05), frequency of tobacco use (χ^2= 19.4, p <.05) and alcohol use (χ^2= 41.7, p <.01), the higher the use of these substances, the higher the use of cannabis.

Table 5. Depression and socio-demographic variables in predicting cannabis use.

		Cannabis users (*N*= 82)	Cannabis non-users (*N*= 625)	*OR*	95% *CI*
		M (SD)	*M (SD)*		
Age		15.10 (1.16)	13.86 (1.28)	0.46	0.37-0.56[**]
Depression		13.19 (6.85)	10.85 (6.27)	0.95	0.92-0.98[**]
		N (%)	*N (%)*		
Gender	Boys	40 (48.8)	325 (52)	1.13	0.71-1.80
	Girls	42 (51.2)	300 (48)		
Nº siblings	0	6 (7.3)	47 (7.5)	[a]	
	1 or 2	66 (80.5)	496 (79.9)	0.96	0.33-2.80
	3 or more	10 (12.2)	82 (13.1)	0.97	0.45-1.86
Coexistence	With both parents	69 (84.1)	537 (85.9)	0.87	0.46-1.64
	With one parent or others	13 (15.9)	88 (14.1)		
Tobacco use	Yes	76 (92.7)	78 (12.5)	88.82	37.42-210.8[**]
	No	6 (7.3)	547 (87.5)		
Alcohol use	Yes	79 (96.3)	195 (31.2)	58.06	18.10-186.2[**]
	No	3 (3.7)	430 (68.8)		

[*]p <.05; [**]p <.01; *N*= sample size; *M*= Mean; *SD*= Standard Deviation; [a]Comparison group; %= Percentage of subjects by columns; *OR*= Odds Ratio; *CI*= Confidence Interval.

DISCUSSION

The aim of this study was to analyze the relation between the use of three different substances; tobacco, alcohol and cannabis, and the existence of depressive symptoms in a school sample of adolescents. The results on the prevalence of substance use revealed that for all ages, alcohol is the substance with the highest rate of use. This trend is consistent with the national pattern of use (Plan Nacional sobre Drogas, 2007).

The data obtained in the present study concluded that high scores in depression were associated to tobacco and alcohol use but not to cannabis use. Smokers tend to score higher in depression than non-smokers. However, the existence of depressive symptoms was not significant in the amount of tobacco consumed. Depressive symptoms were also associated with the consumption of alcohol, though not significantly correlated

with the quantity and frequency of alcohol use. The association between depressive symptoms and alcohol use is consistent with the findings of previous research (Alva, 1995; Scheier, Botvin, & Baker, 1997).

Literature shows that substance use increases with the severity of depressive symptoms (Kelder *et al*., 2001). This study did not present any similar significant trends, except for the use of alcohol, where depressive symptoms increased slightly when there was more alcohol use. However, levels of depression decrease when the use is more than 3 drinks a week, being even lower than for those who consume between 1 and 2 drinks a week (the category immediately above).

Contrary to the results found by Milani, Parrott, Turner, and Fox (2004), no significant differences related to gender were found, except for the consumption of tobacco, but they were dispelled when controlled by other socio-demographic factors such as age and the use of other substances. There was not any significant interaction between depression and gender for any of the substance uses. In a previous study, Vázquez, Becoña, & Míguez (2002) found that smokers had higher depressive symptoms than non-smokers. Smokers from the general population, especially those who smoked 31 or more cigarettes a day, were rated higher on the Beck Depression Inventory and the PANAS scale than non-smokers (Becoña, Vázquez, Lorenzo, & Fuentes, 1998).

The relation between alcohol abuse and other substance use confirms the theory of escalation in consumption. Also, the identification of clinically significant depressive symptoms may reduce the onset of alcohol use. It has been noted that depressive symptoms are an important mediator for the initiation of substance use in vulnerable individuals (Fergusson & Woodward, 2002; Goodman & Huang, 2002; Rohde, Lewinsohn, Kahler, Seeley, & Brown, 2002).

In this study is confirmed the fact that depression symptoms is a factor related to the substance use among adolescents (Bleichmar, 1994; Calafat & Amengual, 1991; Elliot, Huizinga, & Ageton, 1985; Huba *et al*., 1986; Kaplan, 1985). However, the presence of depressive symptoms may be considered also a consequence of the substance use (Muñoz-Rivas & Graña, 2001). Furthermore, the frequent use of alcohol among adolescents is associated with the presence of depressive symptoms (Gleid & Pine, 2002). It has been suggested that alcohol abuse is a symptom of an unidentified depressive disorder (DeMilio, 1989) and it is used as a way of coping with dysphoric moods (Bukstein, Brent, & Kaminer, 1989).

From this study it is possible to conclude, firstly, that there is a significant moderator relationship between the report of depressive symptoms and alcohol, tobacco use, and to a lesser extent, cannabis in adolescents. Secondly, this relation is still relevant for the two legal substances, alcohol and tobacco, even when controlled by other demographic factors. Thirdly, for all the evaluated substances, depression is related to any use but not for the frequency of use. And, finally, the early identification of possible cases of depression should be met in preventive programs by including strategies in order to improve mood and prevent negative moods, regardless of the quantity of use of these substances.

The results should be interpreted taking into account the limitations of the study. The sample comes from a single municipality; it would be desirable to replicate the

work with samples from a different geographical origin. Furthermore, depressive mood has been measured through the total score on a depression scale without taking into account the subscales of the test. The aim of this study was limited so as to make an assessment of a general measure of depression; therefore future studies should include a close analysis of depressive symptoms in response to the various dimensions.

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