Prevalencia y factores asociados al consumo de marihuana en adolescentes escolarizados de Colombia, en el 2016

Prevalence and factors associated with marijuana use in school adolescents in Colombia, in 2016

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Abstract

Introduction: Marijuana is conceived as a low-risk drug, considered illegal in Colombia, and the most consumed by adolescents.

Objective: To describe the prevalence and examine the factors associated with marijuana use during the last 30 days by adolescents in school in Colombia.

Method: Cross-sectional analytical study. Sample is 80,018 adolescents in school between 12 and 18 years of age. An "adolescent user of marijuana" is one who declared having used it during the last thirty days. Variables of interest were considered: sex, age, type of school, episodes of suicidal ideation and deliberate self-harm, the existence of academic and disciplinary performance problems. A description of the prevalence of marijuana was made for each of the variables of interest. Associations were estimated using generalized linear models, all analyzes were adjusted for the expansion factor.

Results: The prevalence of marijuana use in the last 30 days was 4.3% (95% CI 4.1%-4.6%). The highest prevalence of consumption was recorded in adolescents who had reported 3 or more times of suicidal ideation in the last

12 months, and in those who accused 3 or more times of deliberate self-harm in the last 12 months (10.4% and 10. 0%, respectively). An association was found with all the variables studied.

Conclusions: A strong association was found between marijuana use and the presence of episodes of deliberate self-harm and episodes of suicidal ideation in school adolescents.

Keywords: Adolescent; cross-sectional studies; illicit drugs; smoking marijuana, cannabis; Colombia.

Resumen

Introducción: La marihuana es concebida como una droga de bajo riesgo, considerada ilegal en Colombia, si bien es la más consumida por los adolescentes.

Objetivo: Describir la prevalencia y examinar los factores asociados al consumo de marihuana durante los últimos 30 días por adolescentes escolarizados de Colombia.

Método: Estudio transversal analítico. Muestra constituida por 80.018 adolescentes escolarizados entre 12 y 18 años. Se considera "adolescente consumidor de marihuana", a aquél que declaró haberla consumido durante los últimos treinta días. Se tuvieron en cuenta variables de interés, el sexo, la edad, el tipo de colegio, los episodios de ideación suicida y autolesión deliberada, la existencia de problemas de rendimiento académico y disciplinarios. Se realizó una descripción de la prevalencia de marihuana por cada una de las variables de interés. Se estimaron asociaciones por medio de modelos lineales generalizados, todos los análisis fueron ajustados por el factor de expansión.

Resultados: La prevalencia de consumo de marihuana en los últimos 30 días fue del 4,3 % (IC 95 % 4,1 %- 4,6 %). Las mayores prevalencias de consumo se registraron en adolescentes que habían reportado 3 o más veces de ideación suicida en los últimos 12 meses, y en aquellos que acusaron 3 o más veces de autolesión deliberada en los últimos 12 meses (10,4 % y 10,0 %, respectivamente). Se encontró una asociación con todas las variables estudiadas.

Conclusiones: Se evidenció una fuerte asociación entre el consumo de marihuana y presencia de episodios de autolesiones deliberadas y episodios de ideación suicida en adolescentes escolarizados.

Palabras clave: Adolescente; estudios transversales; drogas ilícitas; fumar marihuana, cannabis; Colombia.

1. Introduction

Marijuana is a highly addictive substance; the adverse effects of with-

drawal can lead to regular use (1). Marijuana dependence accounted for 2 million Disability Adjusted Life Years (DALYs) worldwide in 2010, representing an increase of 22% since 1990, which means that it may become a new public health problem (2). It has also been revealed that the consumption of this substance has acute and chronic effects, since, for example, it generates alterations in psychological and physical health (3).

Although cannabis sativa has been conceived as a low-risk drug, it is classified among the substances considered illegal in Colombia, even though it is the most widely used, both by young people (4, 6) and adults (7). Its use has had a considerable growth; in Colombian adolescents, for example, it has been described that the prevalence of consumption has increased in recent years (4, 5), going from 2.8% in 2011 (4), to 4.3% in 2016 (5); reports made between 2011 and 2016 described that between 7.0% and 11.7% of Colombian adolescents have used marijuana at least once in their life (4,5,8).

Several factors have been associated with marijuana use in adolescence. Traditionally, it has been described that sex and age explain a large part of the variability in consumption (4-9); however, taking into account the relationship between marijuana use and some manifestations of mental health disorders (10,11) and school performance (12,13), in addition to the limited information available for Latin American adolescents, there is a need to determine which factors are associated with marijuana use in this age group. Therefore, the aim of this study was to describe the prevalence and examine the factors associated with marijuana use during the last 30 days among adolescents in schools in Colombia.

2. Methodology

Type of study: Analytical cross-sectional study. This report is a secondary analysis of the 2016 National Study of Psychoactive Substance Consumption in the Colombian School Population (ENCSPEC by its acronym in Spanish) (5).

Population and sample: For this study, the population consisted of 3,243,377 young people in school, from 7th to 11th grade, between 12 and 18 years of age, enrolled in 13,282 private and public schools in all the departments of Colombia. A total of 82,761 surveys were collected. After the verification and validation processes, the valid surveys were 80,018. A probabilistic, clustered, stratified multistage, multistage, stratified sampling was used (5).

Procedures: To apply the questionnaires, the arrangements described by

the Inter-American Uniform Consumption Data System (SIDUC) of CICAD/OAS were adopted. The team that carried out the data collection was formed by 122 people in charge of applying the surveys and 31 supervisors, at different levels; all those involved in the process had experience in data collection through surveys of minors.

Evaluation of marijuana use: For this report, the main variable of interest was marijuana use, which was assessed by asking whether the adolescent had used marijuana one or more times during the last 30 days. Those who answered positively to this question were considered to be marijuana users.

Evaluation of interest variables: The following sociodemographic variables were used for the present analysis: 1 Sex (male and female); 2 Age; 3 Type of school (coeducational, male, female); 4. Place of residence (urban and rural). Episodes of suicidal ideation and deliberate self-injury were asked about, in both cases the interval was 12 months (never, once, twice and three times or more). Finally, the adolescent was asked about the existence of academic performance problems in his or her life in the last 12 months (yes, no, or does not know/does not respond), and about disciplinary problems in the last 12 months (yes, no, or does not know/does not respond)).

Statistical analysis: First, an exploratory analysis was performed. After the first step, a description of the frequency distribution was made for each of the variables studied, which were carried out by means of percentages; additionally, the prevalence of marijuana use during the last thirty days was reported, with its confidence interval for each of the variables of interest. To estimate the association between marijuana, use and the variables studied, generalized linear models were constructed (binomial family, link function: Log); the first model was bivariate, the second was adjusted for sex and age. All this was done because the evidence has shown that the two characteristics described explain an important part of the variability in the consumption of psychoactive substances (8,9). Statistical analyses were carried out in version 16 of the Stata program; all analyses were adjusted by the expansion factor (14).

Bias statement

Selection: Due to the type of sampling in which, although the probability of selection of all subjects was known, these probabilities are different; therefore, it is necessary to adjust all analyses for the expansion factor (14).

Classification: It is stated that there could be a classification bias in all variables, mainly in marijuana use, which is closely related to the self-report collection processes (15). In the variables of sex, deliberate self-injury, suicidal

ideation, academic problems and disciplinary problems, there was a category of individuals who did not know or did not respond. Imputation processes were not carried out, due to the limitation that exists when the probabilities of selection are unequal (16,17).

Ethical aspects: The present research was developed under the regulations expressed in Resolution # 8430 of 1993, which was developed by the Ministry of Health of Colombia. The primary study Estudio Nacional de Consumo de Sustancias Psicoactivas en Población Escolar Colombiana, in the year 2016 (ENCSPEC) (5), had an Ethics Committee that approved all data collection procedures. The present secondary analysis adheres to the guidelines that have been described in the GATHER statement (18).

3. Results

The sample consisted of 80 018 adolescents between 12 and 18 years of age, with an average age of 14.81 years (95 % CI 14.79-14.82 years); 52 % were female; 84.0 % were from rural areas; 96 % studied in coeducational schools. The overall prevalence of marijuana use was found to be 4.3% (95% CI 4.1%-4.6%). The highest prevalence of use was found in adolescents who had reported 3 or more episodes of suicidal ideation in the last 12 months; 3 or more times of deliberate self-injury in the last 12 months; and those who reported having disciplinary problems in the last 12 months (10.4%, 10.0% and 8.5%, respectively)). The distribution by each of the variables and the prevalence by each of the variables are shown in **Table 1.**

«The highest prevalence of use was found in adolescents who had reported 3 or more episodes of suicidal ideation in the last 12 months.

Table 1. Distribution and prevalence of marijuana use among school-aged adolescents in Colombia, 2016.

Distribution and prevalence of marijuana use among school-aged adolescents in Colombia, 2016					
	Total sample		Consumers		
	n (%)		n_1	$\%_1$	IC95%
Total	80018	100,0%	3493	4,3%	4,1% - 4,6%
Gender					
Male	37030	47,0%	1949	5,2%	4,8% - 5,6%
Female	42116	52,0%	1504	3,5%	3,2% - 3,8%
Don't know/did not answer	872	1,0%	40	4,0%	2,4% - 6,6%
Age					
Twelve years	5008	7,6%	36	0,5%	0,3.0,8%
Thirteen years	10519	16,6%	191	1,9%	1,5% - 2,3%
Fourteen years	13131	19,6%	449	3,7%	3,2% - 4,3%
Fifteen years old	14549	20,1%	623	4,5%	4,0% - 5,0%
Sixteen years	18512	19,8%	971	5,5%	5,0% - 6,0%
Seventeen years	13272	12,0%	853	7,2%	6,5% - 8,0%
Eighteen years old	5027	4,3%	370	7,9%	6,6% - 9,6%
Type of school					
Men only	243	1,0%	13	8,2%	4,7% - 14,0%
Women only	3241	3,0%	104	2,5%	1,9% - 3,2%
Coeducational	76534	96,0%	3376	4,3%	4,1% - 4,6%
Residence location					
Urbana	71932	84,0%	3248	4,6%	4,3%-4,8%
Rural	8086	16,0%	245	2,8%	2,2%-3,4%
Deliberate self-injury in the last 12 months					
Never	64337	80,1%	2384	3,6%	3,4% - 3,8%
Once	5251	6,4%	334	6,2%	5,2% -7,2%
Twice	179	2,2%	148	7,7%	6,0% - 9,6%
3 or more times	3762	4,5%	368	10,0%	8,5% - 11,7%
Don't know/No answer	4878	6,7%	259	5,2%	4,3%- 6,3%
Suicidal ideation, in the last 12 months					
Never	63121	78,6%	2310	3,6%	03,3% 3,8%
Once	645	7,8%	390	5,7%	4,8% - 6,8%
Twice	1816	2,1%	139	7,8%	6,0%- 9,8%
3 or more times	3719	4,6%	393	10,4%	8,9% -12,1%
Don't know/No answer	4912	6,8%	261	5,3%	4,4%- 6,4%
Academic problems					

Distribution and prevalence of marijuana use among school-aged adolescents in Colombia, 2016					
	Total sample		Consumers		
	n (%)		n_1	$\%_1$	IC95%
Yes	35519	43,8%	2271	6,5%	6,0% - 6,8%
No	43372	54,6%	1186	2,6%	2,4% - 2,9%
No answer	1127	1,6%	36	2,6%	1,4% - 4,6%
Disciplinary problems					
Yes	16591	21,9%	1462	8,5%	7,9% - 9,2%
No	62693	77,2%	2006	3,1%	2,8% - 3,3%
No answer	734	0,9%	25	2,4%	1,4% - 4,1%

n: Total sample for each category of each variable. %: Adjusted percentage frequency of representation of each category of each variable in the sample. n_1 Subjects who reported being users in the last month in each category. $\%_1$*: adjusted prevalence of marijuana uses in each category of each variable.
It is not correct to calculate % with one of the n; all estimates are adjusted by the expansion factor.

The generalized linear models showed associations with all the variables studied. It is noteworthy that adolescents who had reported 3 or more times of suicidal ideation in the last 12 months (PR 3.17 CI 95 % 2.68-3.64), 3 or more times of deliberate self-injury in the last 12 months (OR 3.13 CI 95 % 2.64-3.72) and those who reported having disciplinary problems in the last 12 months (PR 2.84 CI 95 % 2.56-3.16), showed the highest magnitudes of the strength of association. The associations are shown in **Table 2.**

«The objective of this study was to estimate the prevalence and factors associated with marijuana use in a representative sample of school adolescents in Colombia.

Table 2. Association between marijuana use and variables of interest in school-aged adolescents in Colombia, 2016.

Association between marijuana use and variables of interest in school-aged adolescents in Colombia, 2016.						
	Modelo 1			**Modelo 2**		
Gender	**RP**	**IC**	**95%**	**RP**	**IC**	**95%**
Male	1,48	1,33	1,65	1,43	1,29	1,59
Female	1	-	-	1	-	-
Don't know/did not answer	1,15	0,69	1,90	1,14	0,69	1,89
Age	**1,33**	**1,29**	**1,38**	**1,33**	**1,29**	**1,38**
Type of school						
Men only	3,26	1,77	6,00	1,92	1,04	3,55
Women only	1			1	-	-
Coeducational	1,72	1,32	2,24	1,36	1,04	1,79
Residence location						
Urbana	1,63	1,29	2,06	1,70	1,35	2,15
Rural	1	-	-			
Deliberate self-injury in the last 12 months						
Never	1	-	-	1	-	-
Once	1,69	1,42	2,02	1,82	1,53	2,17
Twice	2,10	1,65	3,67	2,28	1,79	2,89
3 or more times	2,75	2,31	3,27	3,13	2,64	3,72
Don't know/No answer	1,44	1,17	1,76	1,42	1,16	1,74
Suicidal ideation, in the last 12 months						
Never	1	-	-			
Once	1,59	1,32	1,92	1,69	1,40	2,03
Twice	2,15	1,68	2,76	2,23	1,74	2,86
3 or more times	2,90	2,45	3,43	3,17	2,68	3,74
Don't know/No answer	1,48	1,21	1,80	1,46	1,19	1,78
Academic problems						
Yes	2,44	2,18	2,73	2,28	2,03	2,55
No	1	-	-	1	-	-
No answer	1,00	0,56	1,78	1,06	0,58	1,94
Disciplinary problems						
Yes	2,75	2,47	3,05	2,84	2,56	3,16
No	1	-	-	1	-	-
No answer	0,79	0,45	1,36	0,83	0,48	1,45
PR: Prevalence ratio. CI95%: confidence interval of 95% All estimates are adjusted for the expansion factor All significant results are shown in bold.						

1. Results

The objective of this study was to estimate the prevalence and factors associated with marijuana use in a representative sample of school adolescents in Colombia. In terms of public health, 4.3% of school adolescents between 12 and 18 years of age reported having used marijuana during the last 30 days. This value is higher than the 2.8% reported in Colombian schoolchildren in 2011, and 1.3% in 2004 (4). Different national surveys in various countries have shown values ranging from 2.3 % to 7.6 % (6,19-23); for example, in 2014, in Mexico, a prevalence of 2.5 % was reported (6); in Argentina, the sixth survey on marijuana use in the school population was 7.6 % (19); in the Peruvian adolescent population, a prevalence of 5.9 % was reported (20); in 2016, in Paraguay, the second survey on drug use showed a prevalence of 2.3 % (21); in Uruguay, the seventh survey on drug use in high school students showed a prevalence of 10.4 % (22); finally, in Spain, in 2016, it was 7.4% (23).

With respect to sex, it was found that men have a higher prevalence of consumption (3.5 % vs. 5.2 %). Studies at national (4,5,8) and international (6,19,21-23) levels, which have evaluated the influence of sex, show consistent results compared to those found in the present report; those results could be explained from a social point of view, because women have differences with men in their development; for example, men are directed to perform activities that normalize the development of risky health behaviors (24). A clear example of this is the normalization of male adolescents to be induced by their family members to consume substances such as alcohol at an early age (25); in addition, it has been described that the reasons for use vary according to sex. For example, women use marijuana as an anxiolytic and to lose their appetite, while men use it to improve their memory and to be more creative (26). It has even been described that, when assessing problems related to marijuana use, it is necessary to use gender-sensitive instruments (27).

The investigation showed an increase in prevalence congruent with age, from 0.5 % at 12 years of age to 7.9 % at 18 years of age. This result is consistent with all reports that have analyzed this relationship (4,20). This trend has also been observed in the consumption of other substances (9), which, hypothetically, could be supported by psychosocial mechanisms, since it has been pointed out that growing up leads to a pseudo-dependence on relationships with parents, as interactions with peers begin to prevail (24); in addition, as age increases, adolescents experience the use of different substances (24,28). The beginning of these social interactions, with people other than

family members or neighbors, favors the acquisition of health behaviors (29); for example, if the young person has friends who are substance users, he/she will tend to be a consumer of a substance (9,28).

As for the types of schools and area of residence, our results found an association. Unfortunately, no evidence was found that explored these phenomena. However, it is hypothesized that there are social mechanisms that could explain this variability; for example, in the case of the area of residence, it could be due to the different social dynamics that occur in urban and rural areas; For example, in the urban area, despite having social characteristics that generate certain types of social advantages compared to the rural area (such as better quality education, higher academic level of teachers, among others) (30), an inverse effect is generated by the ease with which adolescents can acquire psychoactive substances, since the large distribution markets point to the large cities, where the ease with which psychoactive substances can be sold is greater (31).

A result of interest was recorded with respect to the presence of deliberate self-injury (DSI) in the last 12 months. In this characteristic, a systematic pattern was found, in which, as adolescents reported more episodes of self-injury, the higher the prevalence ratio (PR 1.82 one episode of DSI vs PR 3.13 or more episodes of DSI). This finding is in line with that described in a cohort of more than 200,000 adolescents and young adults, aged 10-24 years, where an association was found between cannabis use disorder and deliberate self-injury (AHR, 1.66; 95% CI, 1.52-1.82) (32). Another concordant report is synthesized in a systematic review that included information from about 40 studies published between 1995 and 2020, which concluded that marijuana use significantly increases deliberate self-injury in adult and adolescent populations (33).

In relation to episodes of suicidal ideation, a pattern similar to that described for deliberate self-injury was found; this result is consistent with two meta-analyses (10,11), the first, developed in the general population, with information from six studies in which it was reported that marijuana use shows a consistent association with suicidal ideation (OR 1.43 CI 95 % 1.13-1.83) (10); the second, with information from 23,317 individuals in the population of adolescents and adults (OR 1.50 (CI 95 % 1.11-2.03) (11).

Finally, it was found that those who reported having disciplinary problems during the last 12 months (PR 2.28 CI 95 % 2.03-2.55) and academic performance problems (PR 2.84 CI 95 % 2.56-3.16), showed an association

with marijuana use. Two longitudinal studies have described results similar to those found in the present study (12,13): the first, conducted among upper-middle-class American adolescents, found that regular marijuana use in high school was associated with lower grade point averages on school aptitude tests (12); the second, developed among African-American adolescents, reported that adolescents who experienced academic problems, along with attention or concentration problems, were more likely to use marijuana (13). Another study, which examined in adolescents and young adults at risk for psychosis the relationship between IQ and marijuana use, concluded that significant differences in IQ scores existed between different classifications of marijuana user (34).

The main strengths of this study are that it is one of the first studies to evaluate the association between marijuana use and different variables in a representative sample of the Colombian school population; the sample size is sufficiently large to estimate the associations. Nevertheless, the research presents a series of limitations, such as the fact that, by its nature, the cross-sectional design study does not allow the evaluation of any cause-effect mechanism. Another limitation was the divergence between the time period used for marijuana use, which was during the last 30 days, while a 12-month time window was used for the variables of DSI, suicidal ideation, and academic or disciplinary problems; it was decided to use the 30-day use indicator, as it is the most consistent indicator for current use. However, without underestimating the limitations, the results of the present research generate reference information and favor the development of the construction of knowledge of the factors associated with marijuana use. The estimation of the factors associated with marijuana use is important because it can be the basis for generating interventions focused on reducing the use of psychoactive substances in the school population.

In conclusion, this study shows a strong association between marijuana use and variables such as area of residence, DSI, suicidal ideation, and academic or disciplinary problems among adolescents in school. Further analysis and research are needed to validate our results in order to generate relevant interventions.

nistry of Justice and Law, the Ministry of National Education and the Ministry of Health and Social Protection for conducting the primary study, the source of this analysis.

Conflicts of interests:

None.

Funding:

The primary study was developed by the Observatorio de Drogas de Colombia (ODC), the Ministry of Justice and Law, the Ministry of National Education and the Ministry of Health and Social Protection; the secondary analysis was not funded by any institution.

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