Empirical Article

Psychoactive Substance Use In Medical School Students At A Public University In Argentina: Lifetime Prevalence And Differences

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ABSTRACT

The cross-sectional study assesses lifetime use of psychoactive substances in medical students. During 2018, medical students from "Universidad de Buenos Aires" (UBA) in Argentina were offered the survey. Males significantly used at least one of the substances studied once in their lives compared to women (AOR: 1.75; IC 95%= 1.11- 2.77). Similarly, males used more marijuana (AOR: 1.69; 95% CI = 1.08-2.63). The lifetime prevalence increased with career level for any substance, marijuana and stimulants. Being employed was associated with lifetime consumption of marijuana (AOR: 1.6; 95% CI = 1.03-2.48). Living with peers was associated with lifetime prevalence for stimulants (AOR: 3.5; 95% CI = 1.54-7.97). This study shows a lifetime prevalence for the total substances studied was higher compared to studies in the region. marijuana was the substance with the highest consumption, with more than half surveyed having tried it.

Keywords: higher education, lifetime prevalence, Medical school students, Psychoactive Drugs, substance use

INTRODUCTION

Substance use among young people Worldwide

Substance use and abuse is considered a health risk factor and is one of the major public health problems that affects the entire population generally beginning during adolescence (Salazar Sarmiento, et

al., 2015; Romero, et at., 2009). According to the 2019 World Drug Report from the United Nations Office on Drugs and Crime, in 2017, 271 million people or 5,5% of the world population between 15 and 64 years, used illicit drugs (United Nations, 2019). In 2015 that same report showed that the number of illicit drug users in that age range was 246 million, in 2012 was 230 million, and in 2010 it was just around 200 million. This shows a sustained increase in psychoactive substance use worldwide (United Nations, 2015).

Situation for youth in Argentina

Due to the impact on health, education and public safety, substance use among young people represents a topic of high relevance in our society today (SEDRONAR, 2006). A report conducted in the Province of Buenos Aires by the Secretariat of Programming for the Prevention of Drug Addiction and the Fight against Drug Trafficking (SEDRONAR) shows that between 2001 and 2011 consumption among high school students grew 1200% for ecstasy, 300% for cocaine, and 100% for marijuana. Although, in percentage terms, marijuana showed the lowest growth, it continues to be the most consumed drug, more than tripling the rest (SEDRONAR, 2014). There are multiple causes that explain why certain populations are more vulnerable to drug consumption than others. This vulnerability is the result of social, cultural and economic factors that can impact positively or negatively the consumption (Morera, et at., 2015). In 2017, SEDRONAR conducted a study to obtain reliable and updated information on the magnitude, characteristics and risk factors associated with psychoactive substance use in the urban population from 12 to 65 years. The study showed that alcohol and tobacco (81% and 51.3% respectively) were the substances with the highest lifetime prevalence (percentage of people who report having consumed such substance at least once in their lives), while among the illegal drugs, marijuana (17.4%) and cocaine (5.3%) had the highest prevalence. The lifetime prevalence for tranquilizers without prescription reached 3.2% and for stimulants and hallucinogens was 0.2% (SEDRONAR, 2017). Marijuana and cocaine use was higher among young people between 18 and 24 years with a life prevalence of 17.3% and 5.9% respectively. Finally, the rates of consumption of any illicit drug were higher among the population aged 18 to 34 (more than 17%) compared to 12 to 17 minors and adults from 50 to 65 years (2.7% and 2.3% respectively). Substance use was more prevalent in the population between 18 and 25 years old, an age that coincides with university life (Riquelme Hernández, et at., 2012).

Substance use in College Students. Argentina

The transition from high school to university education entails contact with a new environment, with unique and challenging characteristics. This marks in many the passage from adolescence to adulthood. At this point in their lives many choose to continue the use or try certain psychoactive substances. Arria et al. show that although there is continuation in patterns of consumption started in high school, there is an increase in the use of substances in young people who graduate from high school, after enrolling in the University (Arria et al., 2008).

The information about substance use in college population at a Country level is scarce. In 2006 the Argentine Observatory on Drugs (OAD) developed a research protocol to address this problem within this subgroup of the population. The study focused on psychoactive substance use and its prevalence in undergraduate students from public and private universities throughout the country. Its main objective was to study psychoactive substance use and its prevalence from a sociocultural perspective distinguishing the different types of consumption, the frequency, the modalities and the situations that

facilitate or encourage addictive behaviors and their possible associations with academic, personal and work performance. Tobacco and alcohol were the substances with the highest lifetime prevalence (57.5% and 92.4% respectively). From the illegal substances studied, marijuana (17.6%) and cocaine (2.4%) had the highest lifetime prevalence, being this last one highest within the City of Buenos Aires than in the rest of the country (SEDRONAR, 2006). The higher the level of demand of the career perceived by the students surveyed, the higher the consumption during both the last year and the last month of the career for all the substances studied. A study in college students from Cordoba, Argentina shows a lifetime prevalence for drug use of 33.3% (Pilatti, et al., 2014).

Medical Students

Consumption among medical school students is especially relevant, in addition to the variables that affect the entire population, medical school students are subject to high academic demands that may be associated in some cases to stress, anxiety and mood disorders. These could lead to substance use in students thinking that consumption could improve academic performance, reduce stress or anxiety. In addition, medical school students could have higher access to psychotropic drugs than the general population, which can facilitate abuse and eventual dependence of these substances (Romero et al., 2009; SEDRONAR, 2006).

In a longitudinal study carried out in 1995, 1998 and 1999, the consumption of alcohol, illicit drugs and lifestyles among second and fifth year medical students and one year after graduation, showed a significant increase in consumption of alcohol and the use of illicit drugs in an experimental way, demonstrating an association between career progression and level of consumption (Newbury-Birch, et al., 2001). In line with this, a 2016 study done in medical students from India, shows an increase in substance utilization in the latter years of education (Arora et al., 2016).

Medical Doctors represent a fundamental piece in the treatment of addictions to psychoactive substances. Therefore, medical schools must train students about the risk of using addictive substances and in the promotion of healthy habits. In addition, studying substance use in medical students is important because the perception and detection of addicted patients can be influenced by their own experience (Morera et al., 2015).

Substance use among medical school students could be harmful not only for themselves but also for those around them, as they will be responsible for caring for the health of the community (SEDRONAR, 2006). Medical students will eventually become health professionals and they are expected to become promoters of healthy lifestyles (Romero, et at., 2009).

Although the use of legal and illegal drugs among medical students can be found in international bibliography, no updated national publications have been found that describe the use of antidepressants, psychotropics and marijuana among medical students from public universities (Roncero et al., 2015). The following is a study on drug use among medical school students at a Public University in Argentina in 2018. The University of Buenos Aires (UBA), is one of the main Public Universities in Argentina and in Latina America, with a total enrolled population of over 117.000 students in 2020 (QS Top Universities, 2020). Its school of Medicine is one of the largest, with more than 30.000 enrolled students (Ministerio de Educación, 2018). Although the percentage of international student enrolled in UBA is low, around 4.5%, that percentage has increased almost 500% in the past 20 years (NoticiasUBA, 2016). Considering UBA is tuition free for both domestic and international students, the percentage of international students could

increase in the next years. The objective of this proposal is to study the lifetime prevalence of the main psychoactive substances in medical students at a Public University in Argentina.

METHODOLOGY

We performed a cross-sectional study to assess lifetime use of different psychoactive substances in medical students. We developed a summarized and adapted version of the Argentinean National Survey on the Prevalence of Psychoactive Substance Use, 2011. During March- December 2018, medical students from the first year, fourth year and last year (IAR) from "Universidad de Buenos Aires" (UBA) in Argentina, were offered the survey. This assessment was voluntary and anonymous and was offered to students during Public Health courses. The sample was assumed as a convenience sample. No incentive was offered to answer the questionnaire. Data was analyzed using STATA 16 software. Individuals with missing data for the exposure variables were excluded from the analysis. First, we described the chosen variables and then we examined the differences between the independent variables sex, career level, employment status, household status and the dependent variable, lifetime prevalence. For lifetime prevalence we first included the three analyzed all psychoactive substances studied together and then we analyzed, simulants, sedatives, marijuana and stimulants separately. Next, we examined the association between the individual demographic characteristics and the outcomes. Finally, we performed multivariate analyses controlling for interactions in the final models for the three subgroups of substances analyzed. Multivariate model was adjusted for sex at birth, and career level for the entire sample, sex at birth, career level and employment status for marijuana and career level and household situation for stimulants. For univariate analyses, chi- squared tests and t- tests were used. For the bivariate and the multivariate analyses, logistic regression models were used considering crude OR (COR) and adjusted OR (AOR). The University Institutional Review Board (IRB) approved the protocol.

Definitions of proposed variables

Lifetime prevalence: proportion of people who used any substance at some point in life out of the total number of people studied (White, et al., 2005). Lifetime prevalence and consumption or use of at least once in life will be used as synonyms in this article.

Tranquilizers or Sedatives: prescribed medications used to reduce anxiety, fear, tension, agitation, and related states of mental disturbance. Examples: Benzodiazepines in general.

Stimulants: includes all general stimulant substances such as amphetamines and ecstasy.

Employment status it refers to whether the student works or not, independently of the Full Time Employee (FTE) status, hours per week, formal or informal employment.

Household situation: It refers to who the student lives with. Possible answers: alone, with family members, with peers.

RESULTS

Descriptive analysis

Table 1 shows the lifetime prevalence distribution for all psychoactive substances and then for each subgroup separately.

Table 1: Descriptive Characteristics of the 477 Sample and Stratified by Lifetime Prevalence Per Substance

Variable	Total sample (N=477) Total sample N (%)	Lifetime prevalence total Yes (n=292)	No (n=185)	p value	Lifetime prevalence sedatives Yes (n=78)	No (n=399)	p value	Lifetime prevalence for marijuana Yes (n=255)	No (n=222)	p value	Lifetime prevalence for stimulants Yes (n=71)	No (n=406)	p value
Age (years), average (SD)	23.5 (4.2)	23.8 (4)	23 (4.4)	0.052	24.1 (5.7)	23.4 (3.8)	0.15	24 (4.2)	23 (4.2)	0.009	25 (6.1)	23.2 (3.7)	<0.001
Sex at birth				0.01			0.428			0.009			0.077
Male	121 (25.4)	86 (29.4)	35 (18.9)		17 (21.8)	104 (26.1)		77 (30.2)	44 (19.8)		24 (33.8)	97 (23.9)	
Female	356 (74.6)	206 (70.6)	150 (81.1)		61 (78.2)	295 (73.9)		178 (69.8)	178 (80.2)		47 (66.2)	309 (76.1)	
Career level				<0.001			0.576			<0.001			0.012
1 st year	181 (37.9)	85 (29.1)	96 (51.9)		26 (33.3)	155 (38.9)		68 (26.7)	113 (50.9)		18 (25.3)	163 (40.1)	
4 th year	202 (42.4)	138 (47.3)	64 (34.6)		37 (47.4)	165 (41.3)		125 (49)	77 (34.7)		31 (43.7)	171 (42.1)	
Last year (IAR)	94 (19.7)	69 (23.6)	25 (13.5)		15 (19.2)	79 (19.8)		62 (24.3)	32 (14.4)		22 (31)	72 (17.7)	
Employees status				0.007			0.161			0.002			0.083
Does not work	343 (71.9)	197 (67.5)	146 (78.9)		51 (65.4)	292 (73.2)		168 (65.9)	175 (78.8)		45 (63.4)	298 (73.4)	
Works	134 (28.1)	95 (32.5)	39 (21.1)		27 (34.6)	107 (26.8)		87 (34.1)	47 (21.2)		26 (36.6)	108 (26.6)	
Household situation				0.117			0.212			0.260			0.006
Family members	384 (80.5)	229 (78.4)	155 (83.8)		324 (81.2)	60 (76.9)		200 (78.4)	184 (82.9)		48 (67.6)	336 (82.7)	
Peers	33 (6.9)	19 (6.5)	14 (7.6)		24 (6)	9 (11.5)		17 (6.7)	16 (7.2)		10 (14.1)	23 (5.7)	
Alone	60 (12.6)	44 (15.1)	16 (8.6)		51 (12.8)	9 (11.5)		38 (14.9)	22 (9.9)		13 (18.3)	47 (11.6)	

Total sample

For a total sample of 477 students, 61.2% (292) responded affirmatively to having consumed at least one of the analyzed substances during their lives. The average age of those who had experience with the substances studied was 23.5 (4.2) and does not represent a significant difference with those who did not (p value: 0.052). Almost 71% of those who answered affirmatively were women (p value: 0.010). For the career year, one in two students in the fourth year answered yes affirmatively to having consumed at least one of the analyzed substances during their lives and almost one in three of those students in the IAR

did (p value <0.001). Regarding the employment status, those students working represent 32.5% of those having tried the analyzed substances at least once during their lives (p value: 0.007). Household situation variable was not statistically significant.

Tranquilizers or sedatives

For the total sample of 477 students, 16.3% (78) responded affirmatively to having consumed sedatives at least once in their lifetime. None of the variables analyzed show a statistically significant chi2 when analyzing the frequencies distribution.

Marijuana

Of the total 477 students of our sample, 53.4% (255) used marijuana at least once in the course of their lives. The average age of those who had consumed marijuana was 24 (4.2) with a significant difference with those who did not (p value: 0.0009). Almost 70% of those who answered affirmatively were women (p value: 0.009). For the career year, one in two students in the fourth year answered yes affirmatively to having consumed marijuana during their lives and almost one in three of those students in the IAR did (p value <0.001). Regarding the employment situation, over two third of students that worked consumed marijuana at least once in their lives (p value: 0.002). Household situation variable was not statistically significant.

Stimulants

Of the total 477 students of our sample, 14.9% (71) responded affirmatively to having used stimulants at least once during their lives. The average age of those who had consumed stimulants was 25 (6.1), with a significant difference from those who did not (p value <0.001). For the career year, almost one in two students in the fourth year answered yes affirmatively to having consumed stimulants during their lives and almost one in three of those students in the IAR did (p value <0.006). Regarding the household situation, around 18% of the students living alone had consumed stimulants at least once in their lives (p value: 0.006). Sex at birth and employee status were not statistically significant.

Bivariate analysis

Table 2 shows Crude Odds Ratio (COR) of the bivariate analysis for the independent variables and the outcomes.

Table 2: Bivariate Analysis of the Association between Demographic Characteristics and Lifetime Use Per Substance

	Any substance consumer		sedative consumers		Marijuana consumers		Stimulants consumers	
Variable	Crude OR	95% CI	Crude OR	95% CI	Crude OR	95% CI	Crude OR	95% CI
Age								
	1.05	0.99-1.10	1.03	0.98-1.09	1.06	1.01-1.12	1	0.86-1.16
Sex at birth								
Female	Reference		Reference		Reference		Reference	
Male	1.78	1.14-2.29	0.79	0.44-1.41	1.75	1.14- 2.67	1.6	0.94- 2.79
Career level								
1 st year	Reference				Reference		Reference	
4 th year	2.43	1.60-3.69	1.33	0.77-2.31	2.69	1.78- 4.07	1.6	0.88- 3.04

Last year (IAR)	3.11	1.81- 5.36	1.13	0.56- 2.25	3.21	1.91- 5.42	2.8	1.39- 5.47
Employees status								
Does not work	Reference		Reference		Reference		Reference	
Works	1.8	1.17-2.77	1.44	0.86- 2.42	1.92	1.27- 2.91	1.6	0.93- 2.71
Household situation								
Family members	Reference		Reference		Reference		Reference	
Peers	0.91	0.44-1.88	2.02	0.89- 4.57	0.97	0.47- 1.99	3	1.36- 6.78
Alone	1.86	1.20- 1.81	0.95	0.44- 2.03	1.58	0.90- 2.78	1.9	0.97- 3.83

Total sample

Males had a significantly greater probability of a positive response (COR: 1.78; 95% CI = 1.14-2.29) within those who used at least one of the substances studied in their life. In other words, men were significantly associated with a higher lifetime prevalence for all the substances analyzed together. Regarding the career level, the 4th year (COR: 2.43; 95% CI = 1.60-3.69) and the IAR (COR: 3.11; 95% CI = 1.81- 5.36) showed a higher lifetime prevalence for the substances studied. Similarly, working was significantly associated with a positive lifetime prevalence (COR: 1.8; 95% CI = 1.17-2.77). Finally, living alone was significantly associated with an affirmative lifetime prevalence (COR: 1.86; 95% CI = 1.20-1.81) compared to living with relatives.

Tranquilizers

For tranquilizers, none of the variables studied showed statistical significance for lifetime prevalence.

Marijuana

For those who used marijuana at least once in their life, age was statistically associated with a positive consumption (COR: 1.06; 95% CI = 1.01-1.12); males had significantly higher probability of having used such substance (COR: 1.75; 95% CI = 1.14-2.67). Regarding the career level, during the 4th year there was a higher lifetime prevalence (COR: 2.69; 95% CI = 1.78- 4.07) increasing during the IAR (COR: 3.21; 95% CI = 1.91- 5.42). Similarly, working was significantly associated with its use at least once in lifetime (COR: 1.92; 95% CI = 1.27-2.91). Finally, neither living alone (COR: 1.58; 95% CI = 090-278) nor living with peers (COR: 0.97; 95% CI = 0.47-199) was significantly associated with a positive lifetime prevalence for this substance.

Stimulants

When analyzing career level and using the first year as the reference, we observe the last year, IAR had a significant higher lifetime prevalence (COR: 2.76; IC 95%= 1.39- 5.47). Finally, regarding living with family members, living with peers was significantly associated with having consumed stimulants at least once in a lifetime (COR: 3.04; 95% CI = 1.36- 6.78). There was no significant association with sex for those who used stimulants, at least once in their life, nor with working.

Multivariate analysis

Table 3 shows the multivariate analysis with the adjusted ORs (AOR) and the final models.

Table 3: Multivariate Analysis of the Association between Demographic Characteristics and Llifetime Use Per Substance

Variable	Any substance consumer		Marijuana consumers		Stimulants consumers	
	Adjusted OR	CI 95%	Adjusted OR	CI 95%	Adjusted OR	CI 95%
Sex at birth						
Female	Reference		Reference			
Male	1.75	1.11- 2.77	1.69	1.08- 2.63		
Career level						
1 st year	Reference		Reference		Reference	
4 th year	2.43	1.59- 3.69	2.61	1.72- 3.97	1.68	0.89- 3.16
Last year (IAR)	3.1	1.77-5.29	2.77	1.61- 4.75	2.94	1.46- 5.92
Employees status						
Does not work			Reference			
Works			1.6	1.03- 2.48		
Household situation						
Family members					Reference	
Peers					3.5	1.54- 7.97
Alone					1.76	0.88- 3.53

For the total sample, the model included sex and career level. For marijuana, the model included sex, career level, and employment status. In the case of stimulants, the model included the career level and household situation. No interactions were observed in the proposed models.

Total Sample

From the total sample, males used significantly one of the substances studied at least once in their lives compared to women (AOR: 1.75; IC 95%= 1.11- 2.77). Likewise, the lifetime prevalence is significant and increasing, when advancing in the career, 4th year (AOR: 2.43; 95% CI = 1.59-3.69) and IAR (AOR: 3.10; 95% CI = 1.77-5.29).

Marijuana

For marijuana, men had a significant higher lifetime prevalence compared to women (AOR: 1.69; 95% CI = 1.08-2.63). Also, the lifetime prevalence is significant and increasing, when advancing in the career, 4th year (AOR: 2.61; 95% CI = 1.72-3.97) and IAR (AOR: 2.77; 95% CI = 1.61- 4.75). Lastly, working is associated with a significant lifetime prevalence compared to not working (AOR: 1.6; 95% CI = 1.03-2.48).

Stimulants

In the case of stimulants, the lifetime prevalence is significant higher during the IAR (AOR: 2.94; 95%CI=1.46- 5.92). Finally, living with peers is significantly associated with consuming stimulants at least once in a lifetime (AOR: 3.5; 95% CI = 1.54- 7.97).

DISCUSSION/CONCLUSIONS

The study shows a lifetime prevalence of 61.2% for the total substances studied, which is higher compared to other studies in the region such as in Colombia, where almost 40% of the college students used at least one psychoactive substance in their life (Oficina de las Naciones Unidas contra la Droga y el Delito, 2016, 2017). Other studies conducted in Colombia show a lifetime prevalence of 29% for any substance, significantly lower than that found in our study (Paez Esteban et al., 2012).

Marijuana is the substance with the highest consumption, with more than half of those surveyed who reported having tried it at least once in their life. This is consistent with regional studies that show a lifetime prevalence for marijuana in a university population being close to 51% (Observatorio Uruguayo de Drogas, 2015; Cazenave et al., 2017). Similarly, other studies in the region show that marijuana is the substance most consumed among university students (Caceres et al., 2006; Observatorio Uruguayo de Drogas, 2015). However, at the national level, the lifetime prevalence in the 18 to 24 age group, including university students and their non college peers, is 29.3, lower than what our study shows. This could indicate that, if non-university youth between 18 and 24 years of age were surveyed, the lifetime prevalence would be lower than their university peers.

Specifically for Medical students, a worldwide systematic review shows an overall lifetime prevalence for marijuana of almost 32% with the United States escalating to over 48% (Papazisis, 2018); A lifetime prevalence of 53.4% in our study is concerningly higher than the worst international scenario.

Males have a slightly higher lifetime prevalence than women for marijuana. This is consistent with the 2017 national data in young adults from the general population (SEDRONAR, 2017) and with international data for Medical students (Papazisis, 2018).

The study shows that both for the total of substances studied and for marijuana and stimulants, the lifetime prevalence increases significantly with the years of the career completed. This could indicate that a percentage of those who answered yes to the use of these substances once in their life tried such substance while they were university students. International studies show that the annual incidence of substances such as cocaine and ecstasy is particularly high during the last years of college (Arria, et al., 2017)

Despite the small number of students who reported a positive lifetime prevalence for consumption of stimulants, our analysis shows a strong association between the consumption of this subgroup of substances and the fact of living with peers. Scott et al. describe a positive association between substance use and the influence of peers (Scott, et al., 2015). In addition, other regional studies report a high percentage of first-time substance use due to the influence of peers or friends (Ortega-Pérez, et al., 2011).

Although the present analysis does not report recent or habitual use, it does report the experience of using these substances. Considering that the analyzed sample corresponds to a young population, it could be inferred that the first-time consumption has been not many years ago. In this sense, the 2017

study on the use of psychoactive substances shows the average age of beginning of consumption for marijuana is 18.6 years and for ecstasy it is 22.1 years (White, et al., 2005).

It is essential to have information about the consumption patterns of university students to detect vulnerable populations within the university population whose contact with psychoactive substances can interfere with their learning process and their health (Ortega-Pérez, et al., 2011). Besides detecting vulnerable groups, our finding demonstrates the need of active prevention strategies during college years. Offering substance- free activities and providing healthy alternatives for students are some options proved effective to reduce risks of substance use (Arria, et al., 2008).

LIMITATIONS AND PROPOSALS

This proposal is a cross-sectional study. Therefore, we cannot assess directionality of the associations between exposure and outcome nor can we evaluate causality. Our sample includes only college students, so findings are not generalizable to their non-college peers. In this study, the universe is reduced to a university population of a single school of medicine of the public subsector. In the future, this universe could be expanded to other schools and even to the private university subsector.

In turn, the study only includes the lifetime prevalence of the different psychoactive substances, it does not delve into recent or current use. It would be interesting in the future to investigate these variables to have a more complete look to the problem of substance use in this population group.

Another limitation in this proposal is the limited number of independent variables used. In the future, variables such as socioeconomic, academic and demographics, including differences between domestic and international students could be added. Finally, the non-probabilistic convenience sample, so our true population may not be represented.

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