


Prevalence of the Consumption of Tranquilizers without a Medical Prescription and Associated Factors in School-Based Adolescents in Colombia

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Abstract

Introduction: Non-prescription tranquilizers are a specific group of benzodiazepines, used as drugs that act on the central nervous system and have an extensive effect in patients with anxiety disorders and problems in sleep stages. **Objective:** To determine the prevalence of the year and month of consumption of tranquilizers without a medical prescription and the associated factors, in adolescents in school in Colombia. **Methods:** It is a cross-sectional study with an analytical scope. The universe of the study consisted of 3,243,377 students, from grades 7 to 11 (aged between 12 and 18 years), the valid surveys were 80,018. The adolescent who declared having used tranquilizers during the last 30 days and the last 12 months was considered a consumer. All variables were self-reported by adolescents. **Results:** The prevalence of tranquilizer use without medical prescription was 1.02% and 1.97% (month and year, respectively). Adolescents who presented disciplinary problems are the most predisposed to use during the last month with an OR 2.79 (95% CI: 2.20–3.53) and last year an OR of 2.77 (95% CI: 2.34–3.27). **Conclusions:** There is a higher prevalence of the consumption of tranquilizers without medical prescription in women between 14 and 17 years of age, from mixed schools and it is associated with academic and disciplinary performance problems, in the last year. In addition, as age increases, the consumption of substances without a medical prescription increases.

Keywords: tranquilizing agents; benzodiazepines; prevalence; adolescent behaviour; non-prescription drugs.

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Prevalencia del consumo de tranquilizantes sin prescripción médica y factores asociados en adolescentes escolarizados de Colombia

Resumen

Introducción: Los tranquilizantes sin prescripción médica son un grupo específico de benzodiazepinas, usados como medicamentos que actúan sobre el sistema nervioso central y cuentan con un extenso efecto en pacientes con trastornos de ansiedad y problemas en las etapas del sueño.

Objetivo: Determinar la prevalencia de año y mes de consumo de tranquilizantes sin prescripción médica y los factores asociados en adolescentes escolarizados de Colombia.

Métodos: Estudio transversal con alcance analítico. El universo del estudio estuvo constituido por 3 243 377 estudiantes de los grados 7.º a 11.º (con edades entre 12 y 18 años). Las encuestas válidas fueron 80 018. Se consideró consumidor al adolescente que declaró haber consumido tranquilizantes durante los últimos 30 días y los últimos 12 meses. Todas las variables fueron autorreportadas por los adolescentes.

Resultados: La prevalencia de consumo de tranquilizantes sin prescripción médica fue del 1,02 % y del 1,97 % (mes y año, respectivamente). Los adolescentes que presentaron problemas disciplinarios son los más predispuestos al consumo durante el **último** mes con un OR de 2,79 (IC95 %: 2,20-3,53) y **último** año un OR de 2,77 (IC95 %: 2,34-3,27).

Conclusiones: Existe mayor prevalencia de consumo de tranquilizantes sin prescripción médica en mujeres entre los 14 y los 17 años, de colegios mixtos, y se encuentra asociada con problemas de rendimiento académico y disciplinarios, en el último año. Además, a medida que aumenta la edad, se incrementa el consumo de sustancias sin prescripción médica.

Palabras clave: tranquilizantes; benzodiazepinas; prevalencia; conducta del adolescente; medicamentos sin prescripción.

Prevalência do uso de tranquilizantes sem prescrição médica e fatores associados em adolescentes em idade escolar na Colômbia

Resumo

Introdução: Os tranquilizantes isentos de prescrição são um grupo específico de benzodiazepínicos, usados como medicamentos que atuam no sistema nervoso central e têm um efeito extenso em pacientes com transtornos de ansiedade e problemas no estágio do sono.

Objetivo: Determinar a prevalência anual e mensal do uso de tranquilizantes sem prescrição médica e os fatores associados em adolescentes em idade escolar na Colômbia.

Métodos: Estudo transversal com escopo analítico. O universo do estudo consistiu em 3243377 alunos da 7ª à 11ª série (com idades entre 12 e 18 anos). Foram realizadas 80018 pesquisas válidas. Um adolescente foi considerado usuário, o qual relatou ter usado tranquilizantes nos últimos 30 dias e nos últimos 12 meses. Todas as variáveis foram autorrelatadas pelos adolescentes.

Resultados: A prevalência do uso de tranquilizantes sem prescrição médica foi de 1,02% e 1,97% (mês e ano, respectivamente). Os adolescentes com problemas disciplinares apresentaram maior probabilidade de uso no último mês, com um OR de 2,79 (IC95%: 2,20-3,53) e no último ano, com um OR de 2,77 (IC95%: 2,34-3,27).

Conclusões: Há uma maior prevalência de uso de tranquilizantes sem prescrição médica em mulheres de 14 a 17 anos, de escolas mistas, e isso está associado a problemas de desempenho acadêmico e disciplinar no último ano. Além disso, com o aumento da idade, aumenta o uso de substâncias sem prescrição médica.

Palavras-chave: tranquilizantes; benzodiazepínicos; prevalência; comportamento dos adolescentes; medicamentos sem prescrição médica.

INTRODUCTION

Psychoactive substances are a group of drugs that come in various forms, such as liquids, solids, and inhalants (1). They can alter an individual's mental, physical, emotional, or cognitive states. Among these drugs are tranquilizers without a medical prescription (2), i.e., a specific group of benzodiazepines that are chemical compounds whose name derives from having a benzene ring and a diazepine ring in their structure (3). They are used as medications that perform their function in the central nervous system and have been widely accepted since the 1990s. In addition, tranquilizers have an extensive effect, mainly sedative-hypnotic, but also anxiolytic, muscle relaxant, and anticonvulsant. Such substances are used in people with anxiety disorders and sleep cycle problems (4). Benzodiazepine compounds, like all medications, have adverse reactions depending on the dose administered and, of course, on the individual's tolerance to their use. Among other effects, these compounds produce ataxia, dysarthria, decreased psychomotor skills, or confusion and are likely to cause drug dependence (5).

From the beginning, it has been known that benzodiazepines are a "safe" medication, but uncontrolled or prolonged consumption can lead to drug dependence, which, in turn, brings widespread health problems and even death (6).

Globally, there is talk of inappropriate use and addiction to benzodiazepines and other substances, to the point that different countries include them in their studies on the consumption of psychoactive substances (7). Colombia is no exception since the Government, through its Ministry of Justice, together with other social agents, has made efforts for years to publicize the impact of the illegal use of these substances. Their endeavors have been reflected in small and large studies that condense this information (8,9).

Different study populations in the literature demonstrate that, although there are several groups in which this problem occurs, it is important to focus on adolescents since they are a pillar of society and mark behaviors that can bring permanent cultural and behavioral consequences for adulthood and the community (10). In Colombia, in 2016, it was reported that one in 30 adolescents had consumed tranquilizers without a doctor's order at least once (9). Different studies have associated long-term consequences from the prolonged use of these tranquilizers, including adolescents' cognitive deterioration (3,11), memory deficit (12,13), and alterations in sexuality (14).

Therefore, this research seeks to determine the year and month prevalence of tranquilizer use without a medical prescription and associated factors in school-going adolescents in Colombia during 2016.

MATERIALS AND METHODS

This cross-sectional analytical study corresponds to a secondary analysis of the National Survey on Psychoactive Substance Consumption in the School Population in Colombia 2016 (ENSPEC-2016) (9). The study universe comprises around 3,243,000 Grade 7 to 11 students (between 12 and 18 years old) in approximately 13,300 sites of 11,000 public and private schools from all the provinces of Colombia. Data were collected from 82,761 surveys; however, valid surveys were 80,018. It is a probabilistic, cluster, stratified, and multistage sampling. Further details of the sampling process are in the ENSPEC-2016 report (9).

The data were gathered thanks to a working group of 153 subjects, including facilitators, supervisors, regional coordinators, and a field director. All of them had experience in administering surveys to minors. All forms were self-completed and anonymous. The form was made up of 70 items. For the present analysis, the consumption of tranquilizers without a medical prescription during the last 30 days and over the previous 12 months were taken as dependent variables to answer the research question, and each was evaluated with an item. The independent variables were age, sex (male, female, DK/NA), school type (all-boy, all-girl, co-ed), residence area (rural or urban), academic performance in the last 12 months (yes, no, DK/NA), disciplinary issues in the

previous 12 months (yes, no, DK/NA), relationship with mother (excellent or good, average or poor, indifferent, no mother, NA), and relationship with father (excellent or good, average or poor, indifferent, no father, NA).

A descriptive analysis was performed through an analysis of the socio-demographic, schoolchildren, and relationship with parents distribution through absolute frequencies and percentage frequencies. Subsequently, we estimated the prevalence of tranquilizer consumption in the last 12 months and the previous 30 days. Finally, generalized linear regression models (family: binomial; connection function: logit) were developed to determine the association, in which the dependent variable was tranquilizer consumption in the 30-day and 12-month versions (dichotomous: yes or no). An adjustment was made in both models for sex and age. These two variables were taken into account because it has been described that they could cause confusion between socio-demographic variables and the use of different substances in adolescents. The analyses in this article are adjusted to the expansion factor derived from the probability of selection (15).

The research was conducted under the regulations decreed in Resolution 8430/1993 issued by Colombia's Ministry of Health. The study had authorization to access the database from the Strategic and Analysis Section of the Ministry of Justice and

Law. Besides, this secondary analysis followed the GATHER statement (16).

RESULTS

In total, 80,012 adolescents between 12 and 18 years old were analyzed. The average age was 14.81 years (95% *CI*: 14.79-14.82). The percentage of men was 46.91%. Of the students, 43.84% reported having had academic problems in the last 12 months and 21.86% had disciplinary issues. The characteristics of the adolescents are presented in Table 1.

Table 1. Socio-demographic characteristics of adolescents

Variable	<i>n</i>	%*
Sex		
Male	37,030	47.0
Female	42,116	52.0
DK/NA	872	1.0
Age		
12	5,008	7.60
13	10,519	16.62
14	13 131	19.59
15	14,549	20.13
16	18,512	19.75
17	13,272	12.00
18	5,027	4.33
School type by gender		
All-boy	243	1.0
All-girl	3,241	3.0

Variable	<i>n</i>	%*
School type by gender		
Co-ed	76,534	96
Residence area		
Urban	71,932	84.0
Rural	8,086	16.0
Academic performance problems in the last 12 months		
Yes	35,519	43.84
No	43,372	54.58
DK/NA	1,127	1.58
Disciplinary issues in the last 12 months		
Yes	16,591	21.86
No	62,693	77.23
DK/NA	734	0.91
Relationship with mother		
Excellent or good	65,643	82.0
Average or poor	9,341	12.0
Indifferent	409	0.5
No mother	253	0.5
NA	4,372	5.0
Relationship with father		
Excellent or good	47,613	60.0
Average or poor	16,647	20.0
Indifferent	2,259	3.0
No father	1,910	3.0
NA	11,589	14.0

n: absolute frequency; %*: adjusted percentage frequency. It is not correct to calculate the %* based on the *n* presented in this table; these are adjusted by the expansion factor.

Table 2. Prevalence of tranquilizer use in the last 30 days and the last 12 months by characteristics of adolescents

Variable	Month prevalence				Year prevalence			
	Yes		No		Yes		No	
	<i>n</i>	%*	<i>n</i>	%*	<i>n</i>	%*	<i>n</i>	%*
Total	811	1.02	79,207	98.98	1,657	1.97	77,361	98.03
Sex								
Male	382	1.08	36,648	98.92	756	1.89	35,274	98.11
Female	421	0.98	41,695	99.02	886	2.07	41,230	97.93
DK/NA	8	0.5	864	99.5	15	0.88	857	99.12
Age (in years)								
12	20	0.32	4,988	99.68	39	0.61	4,969	99.39
13	73	0.84	10,446	99.16	129	1.33	10,390	98.67
14	135	1.02	12,996	98.98	236	1.8	12,895	98.2
15	136	0.9	14,413	99.1	292	1.84	14,257	98.16
16	205	1.37	18,307	98.63	475	2.85	18,037	97.15
17	169	1.35	13,103	98.65	342	2.65	12,930	97.35
18	73	1.09	4,954	98.91	144	2.38	4,883	97.62
School type by gender								
All-boy	1	0.82	242	99.18	4	2.08	239	97.92
All-girl	33	0.94	3,208	99.06	73	1.78	3,168	98.22
Co-ed	777	1.03	75,757	98.97	1,580	1.98	74,954	98.02
Residence area								
Urban	754	2	71,178	98	1,552	3	70,380	97
Rural	57	1	8,029	99	105	2	7,981	98
Academic performance problems in the last 12 months								
Yes	491	1.34	35,028	98.66	1,032	2.66	34,487	97.34
No	309	0.75	43,063	99.25	604	1.4	42,768	98.6
DK/NA	11	1.49	1,116	98.51	21	2.87	1,106	97.13
Disciplinary problems in the last 12 months								
Yes	313	1.97	16,278	98.03	633	3.63	15,958	96.37
No	490	0.76	62,203	99.24	1,007	1.49	61,686	98.51
DK/NA	8	0.84	726	99.16	17	3.33	717	96.67

Variable	Month prevalence				Year prevalence			
	Yes		No		Yes		No	
	<i>n</i>	%*	<i>n</i>	%*	<i>n</i>	%*	<i>n</i>	%*
Total	811	1.02	79,207	98.98	1,657	1.97	77,361	98.03
Relationship with mother								
Excellent or good	559	1	65,084	99	1,143	2	64,500	98

n: absolute frequency; %*: adjusted percentage frequency. It is not correct to calculate the %* based on the *n* presented in this table; these are adjusted by the expansion factor.

Table 2 shows the prevalence of tranquilizer consumption without a medical prescription. In the last month and the previous year, it was 1.02% and 1.97% (month and year, respectively), with the highest prevalence in women, with values of 0.98% (month) and 2.07% (year). We found the highest prevalence in students aged between 14 (1.02%) and 17 (1.35%). Moreover, the highest percentage of consumption during the last month and the previous year is attributed to disciplinary problems (1.97% and 3.63%, respectively).

The logistic regression analysis reveals the different associations with the variables taken for the present study. Some congruences were found in the school and adolescent context: Being female increases the probability of consumption per year (95% CI: 1.16-1.26). As age increases, the likelihood of consumption increases (95% CI: 1.08-1.23). Adolescents residing in urban areas are more likely to use per month (95% CI: 1.44-1.05) and per year (95% CI: 1.43-3.10). Finally, adolescents who reported academic performance

problems are more predisposed to consumption (95% CI: 1.39-2.20), month prevalence (95% CI: 1.62-2.23), and year prevalence, as shown in Table 3.

Table 3. Association between tranquilizer use in the last 30 days and the last 12 months and characteristics of adolescents

Variable	Month prevalence		Year prevalence	
	OR	95% CI	OR	95% CI
Sex				
Male	1	---	1	---
Female	0.92	0.73-1.15	1.12	1.16-1.26
DK/NA	0.46	0.15-1.36	0.46	0.21-1.02
Age (in years)	1.15	1.08-1.23	1.21	1.16-1.26
School type by gender				
All-boy	0.72	0.09-5.52	1.17	0.35-3.86
All-girl	1	---	1	---
Co.ed	1.03	0.64-1.66	1.15	0.83-1.60
Residence area				
Urban	2.42	1.44-1.05	2.11	1.43-3.10
Rural	1	---	1	---

Variable	Month prevalence		Year prevalence	
	OR	95 % CI	OR	95 % CI
Academic performance problems				
Yes	1.75	1.39-2.20	1.90	1.62-2.23
No	1	---	1	---
DK/NA	2.37	0.88-6.34	2.55	1.0-6.07
Disciplinary issues in the last 12 months				
Yes	2.79	2.20-3.53	2.77	2.34-3.27
No	1	---	1	---
DK/NA	1.46	0.63-3.37	3.30	1.08-10.11
Relationship with mother				
Excellent or good	1	---	1	---
Average or poor	1.88	1.45-2.44	2.10	1.74-2.53
Indifferent	4.69	1.81-12.16	3.40	1.61-7.15
No mother	3.79	1.38-10.39	4.51	2.40-8.47
NA	1.45	0.68-1.90	1.13	0.78-1.63
Relationship with father				
Excellent or good	1	---	1	---
Average or poor	1.50	1.14-1.97	1.59	1.32-1.91
Indifferent	2.19	1.27-3.79	2.03	1.41-2.94
No father	2.84	1.73-4.66	2.55	1.77-3.67
NA	1.20	0.88-1.65	1.37	1.09-1.73

OR: odds ratio. 95 % CI: 95 % confidence interval. All analyses are adjusted for the expansion factor.

DISCUSSION

The results show that concerning sex, men tended to use more in the last month (women: 0.98%, and men: 1.98%). Women tended to consume mainly in the previous year (2.07%; men: 1.89%).

In 2012, a study in Colombia, with drug-dependent adolescents, found greater consumption in men, with 17.4% compared to 7.8% in women (17). It should be noted that these figures increase, given that only the drug-dependent population was taken for the comparative study.

A Mexican survey of mental health in adolescents observed that, although consumption is higher in men, it has increased significantly in adolescent women over the years. This result reaffirms the findings in this study, in which the highest prevalence of tranquilizer use without a medical prescription in the last month and the last year corresponds to women, with 0.98% (month) and 2.07% (year) (18).

In young adults, a study conducted at a private university in Medellín (Antioquia, Colombia) identified that most consumers were women (19). In Costa Rica, the prevalence of drug use in the school population was higher in women in 2006, 2009, and 2012. In 2006, it was found that men reported 5.2%, while women 6.9%; in 2009, 5.8% for men vs. 9.8% for women, and in 2012, 2.0% for men, unlike women, with 4.0% (20).

Regarding the age variable, it is perceived that the older the age, the greater the consumption. This trend has been seen in the consumption of other substances, such as cigarettes (21) or marijuana (22). The ages with the highest month/

year prevalence were 16 and 17 years old, and immediately there was a drop at the age of 18, with prevalences of 1.37%, 1.35%, and 1.09% per month, and 2.85%, 2.65% and 2.38% per year, respectively. Similar data were reported in the study of psychoactive substance use in adolescents in Bucaramanga, which showed an increase in the pattern of legal and illegal substance consumption in students of the last two high school grades (16).

The same was noted in a study of "risk factors for recreational use of and addiction to psychotropic and narcotic substances in higher education students," where the first contact with illicit drugs occurs in secondary education, and the age of onset was close to 12, with an average of 18 years (23). This was also proven by a study in Spain, which reported that adolescents consume substances to discover new things and fit into the social circle (24). The use of benzodiazepines maintains a mean onset of 15.76 years (25), similar to that found in this study.

Regarding academic performance problems, we found that they are associated in 1.34% of students who used tranquilizers without a medical prescription in the last month and 2.66% of those who consumed them in the last year. The data also show that students who used psychoactive drugs in the last month reported having disciplinary problems in the previous 12 months (1.97%)

and an increase in disciplinary issues in those students who used in the previous year, with 3.63%, since the greater the consumption of substances, the higher the probability of personal impact on the adolescent, as confirmed by a study on the consumption of psychoactive substances and their influence on the comprehensive development of students. Effects derived from psychoactive substances are mainly violence, distraction, and overdose. Additionally, they indicated poor academic performance, poor personal relationships, addiction, anxiety, and damage to a fetus in a pregnant woman who used these substances (7). These are data similar to a 2020 study in which the above factors led to negative moods that affected mental health and, in turn, induced bullying and psychoactive substance use. Another study at a Medellín university showed that 18.8% of those surveyed had canceled subjects; thus, low academic performance is the most related consequence, with 63.5% (26,27).

This study found that 2.06% of the students reported using tranquilizers without a medical prescription in the last month, while 3.96% stated that they had consumed these substances the previous year. These results are similar to the study of prevalence and risk factors for drug consumption and dependence in students at a university in Medellín, in which, of the total number of students who had used drugs at some point in their lives (34.8%), 12.9% claimed to have done

so during the last year, and 7.8% in the previous month (26).

Moreover, a study by Díaz-Geada et al. (27) in 2020 described that a negative mood in adolescents affects optimal academic performance and, in turn, is related to bullying and psychoactive substance use.

CONCLUSIONS

The data allow us to specify that there is a higher prevalence of consumption of tranquilizers without a medical prescription in women between 14 and 17 years old from co-ed schools, as well as a predominance of use in urban areas.

Consumption was associated with academic performance and disciplinary problems in the last year. Besides, the use of substances without a medical prescription increases with older age.

Finally, we can establish that public health actions for the Colombian youth population in schools are urgent to identify consumption and mitigate the consequences of prolonged and indiscriminate use of such substances. Mental health interventions in adolescents are also needed to comprehensively address issues such as bullying, the consumption of psychoactive substances, and emotional dispositions.

LIMITATIONS

For this study, there is a possible classification bias in the use of tranquilizers because it was self-reported (27). Regarding the consumption of these substances in adolescents, it has been pointed out that there is an underestimation due to the above (21,27). Imputation was not applied to the missing values in the variables because these procedures are inappropriate in complex sampling (28,29). Furthermore, causality cannot be evaluated due to the study design (30). Nonetheless, the results of this work provide reference data and favor knowledge generation in the field of psychoactive substance consumption.

Another limitation found is that very few studies have evaluated the relationship between academic performance and disciplinary variables to make a comparison on a national or city scale (24).

Among the study's strengths, in correlation with our records, is that this is the first report in which the factors associated with using tranquilizers without a medical prescription in the Colombian school population are assessed.

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CONFLICT OF INTERESTS

The authors report no conflict of interest.

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