

Psychoactive substance use, family context and mental health among Brazilian adolescents, National Adolescent School-based Health Survey (PeNSE 2012)

Uso de substâncias psicoativas, contexto familiar e saúde mental em adolescentes brasileiros, Pesquisa Nacional de Saúde dos Escolares (PeNSE 2012)

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ABSTRACT: *Objective:* To evaluate the association between the consumption of psychoactive substances (tobacco, alcohol and illicit drugs) and demographic variables, mental health and family context among school-aged children. *Methods:* The National Adolescent School-based Health Survey was held with a national sample of 109,104 students. Data regarding demographic variables, family background and mental health were collected. Logistic regression was used to evaluate the associations of interest. *Results:* Multivariate analyses showed that alcohol consumption was higher among girls, drug experimentation was more frequent among boys and that there was no difference between sexes for smoking. Being younger and mulatto were negatively associated with the use of tobacco, alcohol and illicit drugs. Also negatively associated with such risk behaviors were characteristics of the family context represented by: living with parents, having meals together and parental supervision (when parents know what the child does in their free time). Moreover, characteristics of mental health such as loneliness and insomnia were positively associated with use of tobacco, alcohol and illicit drugs. Not having friends was positively associated with use of tobacco and illicit drugs and negatively associated with alcohol use. *Conclusions:* The study shows the protective effect of family supervision in the use of tobacco, alcohol and drugs and, on the contrary, the increasing use of substances according to aspects of mental health, such as loneliness, insomnia and the fact of not having friends. The study's findings may support actions from health and education professionals, as well as from the government and families in order to prevent the use of these substances by adolescents.

Keywords: Adolescent. Surveys. Family. Tobacco. Alcoholic beverages. Drugs. Loneliness. Mental health.

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RESUMO: *Objetivo:* Avaliar a associação entre o consumo de substâncias psicoativas (tabaco, bebidas alcoólicas e drogas ilícitas) e variáveis demográficas, saúde mental e o contexto familiar em escolares. *Métodos:* A Pesquisa Nacional de Saúde do Escolar foi realizada em uma amostra nacional de 109.104 alunos. Foram coletadas informações referentes às variáveis demográficas, contexto familiar e saúde mental. A regressão logística múltipla foi utilizada para avaliar as associações de interesse. *Resultados:* As análises multivariadas mostraram que o consumo de álcool foi mais elevado entre as meninas, experimentação de drogas foi mais elevada entre os meninos e não houve diferença entre os sexos para tabagismo. Idade mais jovem e ser da cor parda estiveram associados negativamente ao uso do tabaco, bebidas alcoólicas e drogas ilícitas. Também estiveram associadas negativamente a tais comportamentos de risco as características do contexto familiar representadas por: morar com os pais, fazer refeição em conjunto e supervisão parental (os pais saberem o que o filho faz no tempo livre). Por outro lado, características da saúde mental como a solidão e insônia estiveram associadas positivamente ao uso do tabaco, bebidas alcoólicas e drogas ilícitas. Não ter amigos associou-se positivamente ao uso do tabaco e drogas ilícitas, e negativamente ao uso do álcool. *Conclusões:* O estudo aponta o efeito protetor da supervisão familiar no uso de tabaco, álcool e drogas, e, ao contrário, o aumento do consumo em função de aspectos relacionados à saúde mental, como solidão, insônia e não ter amigos. Os achados do estudo podem apoiar ações dos profissionais de saúde, educação, famílias e governo na prevenção contra o uso destas substâncias junto aos adolescentes.

Palavras-chave: Adolescentes. Inquiridos. Família. Tabaco. Bebidas alcoólicas. Drogas. Solidão. Saúde mental.

INTRODUCTION

The use of substances among adolescents may lead to numberless consequences that are harmful to health. Psychoactive substances, such as tobacco, alcohol and other drugs, can increase the occurrence of accidents and types of violence, mood disorders, mental diseases, impaired psychosocial development, unintended pregnancy, exposure to sexually transmitted diseases, mortality, among others¹⁻³. Besides, it is an important predictor of use and dependency during adulthood⁴.

Adolescents are continuously exposed to risk behaviors, such as the use of psychoactive substances. There are several means of continuous exposure to these substances, like alcohol advertisement in communication means, internet, and social networks, publicity of tobacco, influence from friends and celebrities, among others^{5,6}. Besides, many adolescents experiment substances out of curiosity, encouragement from friends and in order to challenge laws and authorities^{3,7}.

The causes leading adolescents to getting involved with substances are extremely complex, and studies have been pointing out that these risks are reduced at the presence of families that play their protective role, therefore monitoring and supporting the adolescents^{2,8}. The support from parents, communication between parents and children and parental supervision are examples of the protective effect concerning these behaviors^{2,8-10}.

Knowing these factors is important for preventive approaches, and also for the reduction or elimination of risks. The role of the family to prevent risk behaviors among teenagers has been emphasized, as well as the strengthening of family connections, going through parental supervision, support and communication between parents and children^{2,8,11,12}. The family aggregates a set of values, beliefs, knowledge and practices that can influence other practices, which promote health among their members or, on the contrary, increase the vulnerability of members for the diseases¹³. The prevention of risk behaviors takes place when parents or parties in charge get involved in supervising the activities of the adolescents, therefore establishing bonds of affection, ambience and dialogue, as well as understanding the needs of the teenagers^{13,14}. A longitudinal study in the United States indicated several protective factors in families, including family connection and cohesion, as well as family supervision. These parental attitudes led to the reduced use of alcohol¹⁵.

Another important factor is mental health. Scientific evidence suggests that adolescents presenting with depression, solitude and other symptoms tend to use substances more frequently during adolescence and afterwards, during adulthood^{3,16}. Studies in the Global School-Based Health Survey (GSHS) have examined the association between risk behaviors (tobacco, alcohol and drug use) and mental health, feeling of solitude, not having friends and insomnia³, therefore indicating an important association between mental health and the use of substances among adolescents.

These studies have been conducted frequently in other countries^{8,11,12,15}. However, in Brazil, there are still few studies about this matter. We can mention studies conducted in the South of Brazil⁹ and the analyses of the I National Adolescent School-based Health Survey².

To assess the use of substances among Brazilian adolescents is useful to support public policies of promotion and prevention. This study analyzes the data from the II National Adolescent School-based Health Survey, conducted in 2012 by the Brazilian Institute of Geography and Statistics (IBGE), together with the Ministry of Health, and it aims at assessing the association between the use of psychoactive substances (tobacco, alcohol and illicit drugs) and demographic variables, mental health and family context among students.

METHODS

The National Adolescent School-based Health Survey (PeNSE 2012) is a cross-sectional study conducted by IBGE, together with the Ministry of Health, with students from the 9th grade of public and private Brazilian schools. The sample of PeNSE 2012 represented Brazil, the five regions and the 26 capitals of Brazilian states and the Federal District. The survey was conducted in 3,004 schools, in 4,288 classrooms, and 109,104 students were interviewed¹⁶.

For the sampling plan, 27 geographic strata corresponding to all of the capitals and the Federal District were defined. The other cities were grouped in each of the five major geographic regions, thus forming five geographic strata. The sample of each geographic

stratum was allocated proportionally to the number of schools, according to the administrative dependency of schools (private and public)¹⁶.

In capitals and in the Federal District, a conglomerate sampling was selected in two stages: the first stage was in schools, and the second one, in eligible classrooms in the selected schools (9th grade).

The five regions were represented by the capitals and by the cities that are not capitals, and for the latter the sample was selected in three stages: homogeneous groups of neighboring cities¹⁶ were the primary sampling units; schools were the secondary sampling units; and classrooms were the tertiary sampling units. In both cases, all of the students in the selected classrooms who were present on the day of data collection formed the sample of students and were invited to participate in the research¹⁶.

The 9th grade was chosen because the students in this period, mostly aged between 13 and 15 years old, have already acquired the necessary skills to answer the self-applicable questionnaire, since they are susceptible to the exposure to several risk factors and because it enables the relative comparability with systems from other countries¹⁶.

The self-applicable structured questionnaire was inserted in the smartphone, with 128 questions. In 2012, some adjustments were made in the questionnaire in order to improve it and to introduce new subjects, as well as to adapt its comparability to the research made by WHO, Health Behavior in School-aged Children¹.

VARIABLE

The outcome variables were: Current smoking (In the past 30 days, how many days did you smoke cigarettes?), being categorized into “No, I never smoked, on any day”, or “Yes, on one or more days in the past 30 days”; Actual alcohol intake (In the past 30 days, how many days did you drink at least one glass or one dose of alcohol?), being categorized into “No, none”, or “Yes, on one or more days in the past 30 days”; Alcohol use (Have you ever used any drugs, such as marijuana, cocaine, crack, solvent-based glue, general ether-based inhalants, popper, ecstasy, oxy etc.), being categorized as “No” or “Yes”.

The variables that were independent from the family context were: living with mother and/or father, being categorized as “No” or “Yes”; Having meals with parents (Do you usually have lunch or dinner with your mother, father or person in charge?), being categorized as “≤ twice or less times a week”, “3 to 4 times a week” or “≥ 5 times a week”; Family supervision, which was measured by the question concerning information parents had about their children’s free time (In the past 30 days, how often were your parents or parties in charge aware of your whereabouts in your free time?), being categorized as “No” or “Yes”; Missing classes without parental permission (In the past 30 days, how many days did you miss classes or school without permission from your parents or parties in charge?), being categorized as “No” or “Yes”.

The independent variables of the mental health module were: Feeling lonely (In the past 12 months, how many times have you felt lonely?), and answers were dichotomized in “No: never, sometimes”, and “Yes: most of the time, always”; Insomnia (In the past 12

months, how often have you not been able to sleep at night because something was on your mind?), and answers were dichotomized in “No: never, sometimes” and “Yes: most of the time, always”; Close friends (How many close friends do you have?), and answers were categorized as “No, none” and “Yes, 1, 2, 3 or more friends”.

STATISTICAL ANALYSIS

At first, the prevalence of the use of the substance was calculated (tobacco, alcohol and other drugs) according to demographic variables and explanatory variables of the family and mental health context. Afterwards, the univariate analysis calculated the crude odds ratio (OR) by employing the Pearson χ^2 test with a 0.05 significance level. Finally, the multivariate analysis was conducted for each of the examined outcomes (tobacco, alcohol and other drugs), by inserting the independent variables that presented association with the outcomes when $p < 0.20$ in the model, by calculating the adjusted OR, with a 95% confidence interval (95%CI). The collected data were analyzed with the statistical package SPSS, version 20.0.

The study was approved by the Research Ethics Committee of the Ministry of Health, report n. 192/2012, concerning registration n. 16805 of CONEP/MS, on March 27, 2012.

RESULTS

PeNSE investigated about 109 thousand 9th grade students, mostly aged between 13 and 15 years old (86%), being 47.8% male and 52.2% female participants. The estimated distribution of students according to color/race showed higher proportions of mulatto (42.2%) and white people (36.8%), followed by black (13.4%), yellow (4.1%) and indigenous people (3.5%).

CURRENT SMOKING

The prevalence of smoking was of 5.1% (95%CI 4.9 – 5.2) and increased with age, reaching 9.7% (95%CI 9.3 – 10.2) among students aged 16 years old or more. There was no difference in the prevalence of use of tobacco according to sex. As to race/color, there was a 4.8% variation (95%CI 4.6 – 5.0) for white and mulatto people, 6.1% (95%CI 4.6 – 5.1) for black people and 6.3% (95%CI 5.6 – 6.6) for indigenous people). Among students in private schools, prevalence was of 3.1% (95%CI 2.9 – 3.4), and of 5.5% (95%CI 5.0 – 6.0) among public school students. In the family context, the prevalence of smoking was of 4.9% (95%CI 4.5 – 5.4) among students living with their father and/or mother, and of 8.3% (95%CI 7.6 – 9.0) among the ones who do not. Concerning students who had meals with their parents five times or more, the prevalence of smoking was of 4.1% (95%CI 3.8 – 4.4) versus 8.9% (95%CI 8.5 – 9.4) among those who did not. For students who missed classes without parental permission, there was also higher prevalence

of smoking (10.5%; 95%CI 10.0–11.0). Concerning mental health, the use of tobacco was more frequent among students who usually feel lonely (7.5%; 95%CI 7.1–8.0), have insomnia (10.1%; 95%CI 9.4–10.7) and do not have close friends (7.9%; 95%CI 7.7–8.2).

After the adjustment for all of the model's variables, some protective factors remained associated with current smoking, such as being younger, that is, aged ≤ 13 years old (OR = 0.47; 95%CI 0.31–0.71), 13 years old (OR = 0.39; 95%CI 0.36–0.43), 14 years old (OR = 0.50; 95%CI 0.47–0.54) or 15 years old (OR = 0.80; 95%CI 0.74–0.87), besides the color/mulatto race (OR = 0.86; 95%CI 0.80–0.91). Students attending public school presented higher chances of smoking (OR = 1.23; 95%CI 1.12–1.35), as well as those who missed classes without parental permission (OR = 2.69; 95%CI 2.54–2.85). In the family context, there were other protective factors: living with father and/or mother (OR = 0.83; 95%CI 0.75–0.92); having meals with parents twice a week (OR = 0.82; 95%CI 0.75–0.90), 3 to 4 times (OR = 0.78; 95%CI 0.68–0.90) or 5 times (OR = 0.67; 95%CI 0.62–0.72); and parents knowing about their whereabouts during free time (OR = 0.49; 95%CI 0.46–0.52). With regard to mental health variables, the lonely feeling was associated with the higher chances of smoking (OR = 1.27; 95%CI 1.19–1.37), as well as having insomnia (OR = 1.77; 95%CI 1.63–1.91) and not having close friends (OR = 1.25; 95%CI 1.10–1.42) (Table 1).

Table 1. Prevalence and association of tobacco use with sociodemographic characteristics, mental health and family background among Brazilian school-aged children, PeNSE 2012.

Variable	Regular smoking										
	%	95%CI		OR	95%CI		p value	OR*	95%CI		p value
		Lower	Higher		Lower	Higher			Lower	Higher	
Total	5.1	4.9	5.2								
Age (years)							< 0.001				
< 13	3.1	2.1	4.6	0.30	0.20	0.44		0.47	0.31	0.71	< 0.001
13	2.8	2.6	3.1	0.27	0.25	0.30		0.39	0.36	0.43	< 0.001
14	4.0	3.7	4.3	0.38	0.36	0.41		0.50	0.47	0.54	< 0.001
15	7.2	6.7	7.8	0.72	0.67	0.78		0.80	0.74	0.87	< 0.001
16 or more	9.7	9.3	10.2	1.00				1.00			
Sex							0.339				
Male	5.1	4.9	5.4	1.03	0.97	1.08					
Female	5.0	4.8	5.2	1.00							
Race							< 0.001				
White	4.8	4.6	5.0	1.00				1.00			
Black	6.1	5.6	6.6	1.28	1.18	1.39		0.95	0.88	1.04	0.267
Yellow	5.3	4.7	6.1	1.11	0.97	1.28		0.92	0.79	1.06	0.240
Mulatto	4.8	4.6	5.1	1.00	0.94	1.07		0.86	0.80	0.91	< 0.001
Indigenous	6.3	5.6	7.2	1.34	1.16	1.53		1.07	0.92	1.23	0.393

Table 1. Continuation.

Variable	Regular smoking											
	%	95%CI		OR	95%CI		p value	OR*	95%CI		p value	
		Lower	Higher		Lower	Higher			Lower	Higher		
School								< 0.001				
Private	3.1	2.9	3.4	1.00				1.00				
Public	5.5	5.0	6.0	1.81	1.66	1.98		1.23	1.12	1.35	< 0.001	
Living with mother and/or father								< 0.001				
No	8.3	7.6	9.0	1.00				1.00				
Yes	4.9	4.5	5.4	0.57	0.52	0.63		0.83	0.75	0.92	< 0.001	
Having meals with parents or parties in charge								< 0.001				
No	8.9	8.5	9.4	1.00				1.00				
Twice a week or less	6.0	5.6	6.5	0.65	0.60	0.71		0.82	0.75	0.90	< 0.001	
3 to 4 times a week	5.0	4.4	5.6	0.53	0.47	0.61		0.78	0.68	0.90	0.001	
5 times a week or more	4.1	3.8	4.4	0.43	0.41	0.47		0.67	0.62	0.72	< 0.001	
Family supervision								< 0.001				
No	7.9	7.7	8.2	1.00				1.00				
Yes	3.0	2.9	3.2	0.37	0.34	0.39		0.49	0.46	0.52	< 0.001	
Missing classes without permission								< 0.001				
No	3.2	3.1	3.3	1.00				1.00				
Yes	10.5	10.0	11.0	3.58	3.39	3.78		2.69	2.54	2.85	< 0.001	
Feeling lonely								< 0.001				
No	4.6	4.4	4.7	1.00				1.00				
Yes	7.5	7.1	8.0	1.70	1.59	1.81		1.27	1.19	1.37	< 0.001	
Insomnia								< 0.001				
No	4.5	4.4	4.6	1.00				1.00				
Yes	10.1	9.4	10.7	2.37	2.21	2.55		1.77	1.63	1.91	< 0.001	
Friends								< 0.001				
1 or more	4.9	4.8	5.1	1.00				1.00				
No friends	7.9	7.0	8.8	1.64	1.46	1.86		1.25	1.10	1.42	0.001	

*Adjusted for significant variables in the model.

CURRENT ALCOHOL INTAKE

The prevalence of current alcohol use increased with age; among teenagers aged less than 13 years old, it was 11.4% (95%CI 9.4 – 13.8), and among those aged more than 16 years old, it was 37.4% (95%CI 36.7% – 38.2%). Alcohol use was more prevalent among girls in relation to boys (26.9% vs. 25.2%) and also in public schools in relation to private ones (26.7% vs. 23.0%). Concerning ethnicity/color, the prevalence was higher among black, yellow and indigenous participants (about 27%). In the family context, the prevalence of current alcohol use was of 25.7% (95%CI 24.7 – 26.8) among students living with their father and/or mother, and of 32.6% (95%CI 31.4 – 33.8) for those who do not live with parents. The prevalence was lower for those who have meals with parents or parties in charge for five days a week or more (23.3%; 95%CI 22.6% – 24.0) and for those who are monitored by their families (20.7%; 95%CI 20.2 – 21.1). With regard to mental health, the highest prevalence of alcohol use was found among those who felt lonely (31.8%; 95%CI 31.1 – 32.6), had insomnia (37.4%; 36.4 – 38.4) and with one or more close friends (26.2%; 95%CI 24.7 – 27.7).

The prevalence of current alcohol intake was of 26.1% (95%CI 25.8 – 26.4), being very similar concerning the behavior in relation to tobacco. After the adjustment for all of the variables in the model, the following variables remained associated with alcohol intake as protective factors: being male (OR = 0.85; 95%CI 0.82 – 0.87); being younger, that is, aged ≤ 13 years old (OR = 0.27; 95%CI 0.21 – 0.33), 13 years old (OR = 0.46; 95%CI 0.43 – 0.48), 14 years old (OR = 0.58; 95%CI 0.56 – 0.61), 15 years old (OR = 0.85; 95%CI 0.81 – 0.89); black color/race (OR = 0.89; 95%CI 0.85 – 0.93), yellow (OR = 0.90; 95%CI 0.84 – 0.97) and mulatto (OR = 0.85; 95%CI 0.82 – 0.88). Unlike tobacco, students from public schools had less chances of drinking (OR = 0.96; 95%CI 0.92 – 1.00).

In the family context, protective factors were: living with father and/or mother (OR = 0.92; 95%CI 0.87 – 0.96); having meals with parents twice a week (OR = 0.90; 95%CI 0.86 – 0.98) or 5 times a week (OR = 0.75; 95%CI 0.72 – 0.78); fathers being aware of the children's whereabouts during their free time (OR = 0.60; 95%CI 0.58 – 0.61). However, missing classes without parental permission was associated with the higher chance of drinking (OR = 1.98; 95%CI 1.92 – 2.04). With regard to mental health, the fact of feeling lonely increased the chances of using alcohol (OR = 1.16; 95%CI 1.11 – 1.20), as well as having insomnia (OR = 1.46; 95%CI 1.39 – 1.53). However, unlike the use of tobacco, not having friends was a protective factor for alcohol intake (OR = 0.71; 95%CI 0.65 – 0.77). That is, alcohol intake is more frequent for people who have friends (Table 2).

USE OF DRUGS AT LEAST ONCE DURING LIFE

The prevalence of drug use increased with age; among teenagers aged less than 13 years old, it was 6.0% (95%CI 4.5 – 7.8), and among those aged more than 16 years old, it was 10.6% (95%CI 10.1 – 11.1). Drug use was more prevalent among boys in relation to girls (7.9% vs. 6.3%), and also in public schools in relation to private ones (7.2% vs. 6.3%).

Table 2. Prevalence and association of alcohol use with sociodemographic characteristics, mental health and family background among Brazilian school-age children, PeNSE 2012.

Variable	Regular alcohol intake										
	%	95%CI		OR	95%CI		p value	OR*	95%CI		p value
		Lower	Higher		Lower	Higher			Lower	Higher	
Total	26.1	25.8	26.4								
Age (years)	< 0.001										
< 13	11.4	9.4	13.8	0.22	0.17	0.27		0.27	0.21	0.33	< 0.001
13	19.0	18.3	19.7	0.39	0.37	0.41		0.46	0.43	0.48	< 0.001
14	23.8	23.1	24.5	0.52	0.50	0.54		0.58	0.56	0.61	< 0.001
15	32.8	31.8	33.8	0.82	0.78	0.85		0.85	0.81	0.89	< 0.001
16 or more	37.4	36.7	38.2	1.00				1.00			
Sex	< 0.001										
Male	25.2	24.7	25.8	0.92	0.90	0.95		0.85	0.82	0.87	< 0.001
Female	26.9	26.5	27.2	1.00				1.00			
Race	< 0.001										
White	26.3	25.8	26.7	1.00				1.00			
Black	27.7	26.8	28.6	1.08	1.03	1.12		0.89	0.85	0.93	< 0.001
Yellow	26.9	25.5	28.3	1.03	0.96	1.11		0.90	0.84	0.97	0.005
Mulatto	25.3	24.7	25.9	0.95	0.92	0.98		0.85	0.82	0.88	< 0.001
Indigenous	27.7	26.2	29.2	1.08	1.00	1.16		0.93	0.86	1.00	0.051
School	< 0.001										
Private	23.0	22.4	23.6	1.00				1.00			
Public	26.7	26.0	27.5	1.22	1.18	1.27		0.96	0.92	1.00	0.036
Living with mother and/or father	< 0.001										
No	32.6	31.4	33.8	1.00				1.00			
Yes	25.7	24.7	26.8	0.72	0.68	0.76		0.92	0.87	0.98	0.010
Having meals with parents or parties in charge	< 0.001										
No	35.0	34.2	35.8	1.00				1.00			
Twice a week or less	29.5	28.6	30.5	0.78	0.74	0.82		0.90	0.86	0.95	< 0.001
3 to 4 times a week	29.7	28.3	31.1	0.79	0.73	0.84		1.02	0.95	1.10	0.571
5 times a week or more	23.3	22.6	24.0	0.56	0.54	0.59		0.75	0.72	0.78	< 0.001
Family supervision	< 0.001										
No	33.7	33.3	34.2	1.00				1.00			
Yes	20.7	20.2	21.1	0.51	0.50	0.53		0.60	0.58	0.61	< 0.001
Missing classes without permission	< 0.001										
No	21.5	21.2	21.8	1.00				1.00			
Yes	39.2	38.5	39.9	2.34	2.28	2.41		1.98	1.92	2.04	< 0.001

Table 2. Continuation.

Variable	Regular alcohol intake										
	%	95%CI		OR	95%CI		p value	OR*	95%CI		p value
		Lower	Higher		Lower	Higher			Lower	Higher	
Feeling lonely							< 0.001				
No	24.9	24.6	25.2	1.00				1.00			
Yes	31.8	31.1	32.6	1.41	1.36	1.46		1.16	1.11	1.20	< 0.001
Insomnia							< 0.001				
No	24.9	24.6	25.1	1.00				1.00			
Yes	37.4	36.4	38.4	1.80	1.73	1.88		1.46	1.39	1.53	< 0.001
Friends							< 0.001				
1 or more	26.2	24.7	27.7	1.00				1.00			
No friends	23.3	22.0	24.7	0.86	0.80	0.93		0.71	0.65	0.77	< 0.001

*Adjusted for significant variables in the model.

Concerning ethnicity / color, the prevalence was higher among black, yellow and indigenous participants (8.6% in all of the categories). In the family context, the prevalence of drug use was lower among students living with their father and/or mother (6.9%; 95%CI 6.3 – 7.5), for those who have meals with parents or people in charge for five days a week or more (5.7%; 95%CI 5.4% – 6.1), those who are monitored by their families (5.2%; 95%CI 4.9 – 5.4) and the ones who do not miss classes without parental permission (5.5%; 95%CI 5.4 – 5.7). With regard to mental health, the highest prevalence of drug use was observed among the ones who felt lonely (9.4%; 95%CI 9.0 – 9.9), those who had insomnia (11.7%; 11.0 – 12.3) and the ones with no close friends (10.3%; 95%CI 9.4 – 11.4).

The prevalence of using other drugs, such as marijuana, cocaine, crack, solvent-based glue, general ether-based inhalants, poppers, ecstasy, oxy etc. was of 7.1% (95%CI 6.9 – 7.2). After being adjusted for all of the variables in the model, protective factors for the use of drugs were: being younger, that is, aged ≤ 13 years old (OR = 0.71; 95%CI 0.53 – 0.97), 13 years old (OR = 0.51; 95%CI 0.47 – 0.56) or 14 years old (OR = 0.68; 95%CI 0.63 – 0.73). Being mulatto was a protective factor (OR = 0.78; 95%CI 0.74 – 0.82). Students attending the public school had less changes of using drugs (OR = 0.92; 95%CI 0.86 – 0.99). However, the fact of being male presented more chances of using drugs (OR = 1.21; 95%CI 1.16 – 1.28). In the family context, protective factors were: living with father and/or mother (OR = 0.84; 95%CI 0.77 – 0.92); having meals with parentes twice a week (OR = 0.83; 95%CI 0.77 – 0.90) or 5 times a week (OR = 0.61; 95%CI 0.57 – 0.65) and parents knowing the whereabouts of students during their free time (OR = 0.63; 95%CI 0.60 – 0.66). However, missing classes without parental permission increased the chances of using drugs (OR = 1.79; 95%CI 1.70 – 1.86). With regard to mental health, the following has been associated with the use of other drugs: feeling lonely (OR = 1.22; 95%CI 1.14 – 1.30); having insomnia (OR = 1,53; 95%CI 1.42 – 1.64) and not having friends (OR = 1.19; 95%CI 1.06 – 1.33) (Table 3).

Table 3. Prevalence and association of drug experimentation with sociodemographic characteristics, mental health and family background among Brazilian school-aged children, PeNSE 2012.

Variable	Use of drugs**										
	%	95%CI		OR	95%CI		p value	OR*	95%CI		p value
		Lower	Higher		Lower	Higher			Lower	Higher	
Total	7.1	6.9	7.2								
Age (years)							< 0.001				
< 13	6.0	4.5	7.8	0.54	0.40	0.72		0.71	0.53	0.97	0.029
13	4.5	4.1	4.8	0.40	0.37	0.43		0.51	0.47	0.56	< 0.001
14	6.2	5.9	6.6	0.56	0.53	0.60		0.68	0.63	0.73	< 0.001
15	9.7	9.1	10.4	0.91	0.85	0.98		0.99	0.92	1.06	0.749
16 or more	10.6	10.1	11.1	1.00				1.00			
Sex							< 0.001				
Male	7.9	7.6	8.2	1.28	1.22	1.34		1.21	1.16	1.28	< 0.001
Female	6.3	6.1	6.5	1.00				1.00			
Race							< 0.001				
White	7.2	7.0	7.5	1.00				1.00			
Black	8.6	8.0	9.1	1.20	1.12	1.29		0.97	0.91	1.05	0.446
Yellow	8.6	7.8	9.5	1.21	1.08	1.35		1.07	0.96	1.20	0.233
Mulatto	6.1	5.8	6.5	0.84	0.80	0.89		0.78	0.74	0.82	< 0.001
Indigenous	8.6	7.7	9.6	1.21	1.07	1.36		1.03	0.91	1.17	0.597
School							< 0.001				
Private	6.3	6.0	6.7	1.00				1.00			
Public	7.2	6.8	7.7	1.15	1.08	1.23		0.92	0.86	0.99	0.016
Living with mother and/or father							< 0.001				
No	10.1	9.4	10.9	1.00				1.00			
Yes	6.9	6.3	7.5	0.66	0.60	0.72		0.84	0.77	0.92	< 0.001
Having meals with parents or parties in charge							< 0.001				
No	11.5	11.0	12.1	1.00				1.00			
Twice a week or less	8.4	7.9	9.0	0.71	0.65	0.76		0.83	0.77	0.90	< 0.001
3 to 4 times a week	8.7	7.9	9.6	0.73	0.66	0.82		0.94	0.84	1.05	0.269
5 times a week or more	5.7	5.4	6.1	0.47	0.44	0.50		0.61	0.57	0.65	< 0.001

Table 3. Continuation.

Variable	Use of drugs**										
	%	95%CI		OR	95%CI		p value	OR*	95%CI		p value
		Lower	Higher		Lower	Higher			Lower	Higher	
Family supervision							< 0.001				
No	9.7	9.4	10.0	1.00				1.00			
Yes	5.2	4.9	5.4	0.51	0.48	0.53		0.63	0.60	0.66	< 0.001
Missing classes without permission							< 0.001				
No	5.5	5.4	5.7	1.00				1.00			
Yes	11.5	11.0	12.0	2.22	2.12	2.33		1.79	1.70	1.88	< 0.001
Feeling lonely							< 0.001				
No	6.6	6.4	6.7	1.00				1.00			
Yes	9.4	9.0	9.9	1.48	1.40	1.56		1.22	1.14	1.30	< 0.001
Insomnia							< 0.001				
No	6.5	6.4	6.7	1.00				1.00			
Yes	11.7	11.0	12.3	1.89	1.77	2.01		1.53	1.42	1.64	< 0.001
Friends							< 0.001				
1 or more	6.9	6.8	7.1	1.00				1.00			
No friends	10.3	9.4	11.4	1.55	1.39	1.72		1.19	1.06	1.33	0.003

*Adjusted for significant variables in the model; **Marijuana, cocaine, crack, solvent-based glue, general ether-based inhalants, ecstasy, oxy, etc.

DISCUSSION

PeNSE indicated that the use of substances (tobacco, alcohol and other drugs) increases with age, and it is associated with family context and mental health. There are gender-related differences according to the used substance, and alcohol is prevalent among girls and other drugs are prevalent among boys. Concerning race/color, the use of substances was less frequent among mulattos and black people. Students attending public schools have more chances of using tobacco and, on the other hand, students from private schools are more prone to using alcohol and other drugs. In the family context, family practices, such as having meals with parents or parties in charge, living with parents and the fact that the latter know about the whereabouts of their children during their free time have protective effects on the use of substances, while missing classes without notifying the parents is strongly associated with the three aforementioned risk behaviors. Mental health indicators, such as solitude and insomnia, showed higher risk for the use of substances, while not having close

friends is associated with the use of tobacco and drugs. Surveys conducted by WHO^{1,3,17} demonstrate that the use of psychoactive substances is more frequent among boys and increases with age^{3,18}. In PeNSE, being young was a protective factors, which is in accordance with literature^{1,3,17}. With regard to sex, the use of drugs was more common among boys and, unlike what is demonstrated in literature, the use of alcohol was more frequent among girls. The Health Behavior in School Aged Children (HBSC) found prevalence of 17% in the use of alcohol among female participants and prevalence of 25% among male participants¹, and such a behavior occurred in most researched countries. These findings can be explained by the earlier puberty among girls, which makes them more prone to consuming alcohol. However, with time, they are overcome by the boys¹⁹.

The risk of using tobacco was higher among students attending public schools, and the risk of the regular intake of alcohol and trying other drugs was higher among those attending private schools, which, in this study, would be the closest factor indicating higher socioeconomic status. A study conducted in California showed that students with money available in their pockets tend to be more frequently engaged in risky behaviors, thanks to higher purchase power and independency²⁰.

In the family context, the most important protective factors to reduce the use of psychoactive substances were: family supervision or knowing about the whereabouts of the children during their free time, having meals together and living with parents, which was in accordance with other studies^{3,8}. Literature indicates how important it is for parents to be interested in the daily lives of their children, the places they go to, what they do in their free time, and the friends they relate to. These practices influence the risk behavior during adolescence, such as the use of alcohol and other drugs¹⁰, besides the sexual risk behavior²¹.

All of the three risk behaviors were associated with little supervision and little support from the parents, which is in accordance with other studies about family context^{2,8,22-24}. The most significant indicator for little parental supervision was the habit of missing classes without consent. It is possible to observe a dose-response gradient effect: the more the students miss classes, the higher the risk of using substances. The findings about the use of substances being associated with the habit of missing classes without notifying the parents (thus leading to school evasion) is also supported by literature. Missing classes/school evasion is an important risk marker, being generally associated with an unstable family environment. Other studies point out that students who were absent from school are more involved with the use of substances than the ones who attended classes²⁵.

Family relationships and cohesions, as well as participating in activities together with family members, have a protective effect on the prevention against the use of alcohol and other drugs¹⁴. Literature demonstrates that the performance of family activities, such as talking, going out together and having meals constitute protective factors that reduce risk behaviors¹³. The importance of the positive relationship between parents has been documented for the reduction of risks, such as juvenile delinquency, depression and psychosomatic symptoms²⁶. Therefore, "having meals with parents" protects against risk behaviors, such as smoking,

drinking and using drugs². Parental support and good communication between parents and children, as well as parental supervision over the students, are strong protective factors against these risk behaviors^{2,3}. There are other family factors which, on the contrary, can generate risks, such as the presence of parents who are dependent on substances²⁶, family violence, among others²⁷.

All of the studied variables about mental health were associated with the use of psychoactive substances. These results suggest that approaching these psychosocial characteristics may lead to benefits for the prevention of several risk behaviors. According to Alwan et al.³, not having friends, or having less than two close friends, usually increases the probability of using substances, since solitude and social isolation would be associated with this increasing use. On the other hand, having too many friends and being popular would have controversial results. Some studies show that popular students tend to have higher rates of risk behaviors²⁸, and explain that this may be the result of more opportunities to adopt such behaviors because of the larger social network. However, this is controversial, and other studies suggest that having many friends would be a protective factor against risk behaviors²⁹.

PeNSE showed that not having friends leads to the use of tobacco and other illicit drugs. That is, these substances are more connected to social isolation and mental suffering behaviors. Studies point out that individuals tend to use psychosocial substances to deal with stress, tensions and mental suffering situations^{4,30}, showing the importance of approaching themes related to mental suffering during childhood.

However, the opposite has been found for the use of alcohol: not having friends was a protective factor for the use of alcohol, and having one or more friends increased the chances of consuming alcohol among students. This result is in accordance with the way alcohol is used in our culture, being associated with pleasure, relationships, celebrations and parties; therefore, its consumption is stimulated in social situations³¹.

Among study limitations, PeNSE used a self-applicable interview, which may contain measuring errors caused by under-reporting or by the difficulty students may have had to understand the survey questions. In this case, the report of the use of substances may reflect the perception of such use, and not the real situation, which may end up reflecting more experimentation than regular use. Besides, the study was conducted with students with good school attendance, and the real prevalence of the use of substances among adolescents may have been underestimated, since students who miss school tend to present higher prevalence of risk behaviors than the one who do not miss classes (on a test day)²⁵. Besides, this is a cross-sectional study, and the observed associations do not necessarily have a cause-effect relationship; this would be better observed in longitudinal studies.

There are also other situations and variables that were not included in this study, and that may influence the use of substances, such as the relationships with peers, socioeconomic conditions, among others.

CONCLUSION

The results in this study show the importance of family and mental health for the adoption of psychoactive substances among Brazilian adolescents. The study points out to the protective effect of family supervision, and also to the association between aspects related to mental health, such as solitude, insomnia and the fact of not having friends, with the use of tobacco, alcohol and drugs.

Habits that are acquired in this stage of life tend to remain during adulthood, besides increasing the vulnerability of these teenagers to several risk situations, especially the involvement with accidents and violent events. The findings concerning family context indicate that family supervision has a protective effect on the abuse of substances during adolescence. Family plays an essential role that needs to be encouraged and studied, especially with regard to the importance of well-structured family bonds in the lives of adolescents.

Professionals who work in the health field with adolescents should consider that mental health status and family context situations may influence the support for the development of health behaviors.

REFERENCES

1. Organização Mundial da Saúde. Social determinants of health and well-being among young people. Health Behaviour in School-aged Children (HBSC) study: international report from the 2009/2010 survey. Copenhagen: WHO Regional Office for Europe; 2012 (Health Policy for Children and Adolescents, No. 6).
2. Malta DC, Porto DL, Melo FC, Monteiro RA, Sardinha LM, Lessa BH. Família e proteção ao uso de tabaco, álcool e drogas em adolescentes. Pesquisa Nacional de Saúde dos Escolares. Rev. Bras. Epidemiol 2011; 14(1): 166-77.
3. Alwan H, Viswanathan B, Rousson V, Paccaud F, Bovet P. Association between substance use and psychosocial characteristics among adolescents of the Seychelles. BMC Pediatr 2011; 11: 85.
4. Kumpulainen K. Psychiatric symptoms and deviance in early adolescence predict heavy alcohol use 3 years later. Addiction 2000; 95(12): 1847-57.
5. Vendrame A, Pinsky I, Faria R, Silva R. Apreciação de propagandas de cerveja por adolescentes: relações com a exposição prévia às mesmas e o consumo de álcool. Cad Saúde Pública 2009; 25(2): 359-65.
6. Brown JD, Witherspoon EM. The mass media and American adolescents' health. J Adolesc Health 2002; 31(6): 153-70.
7. Suris JC, Michaud PA, Akre C, Sawyer SM. Health risk behaviors in adolescents with chronic conditions. Pediatrics 2008; 122(5): e1113-8.
8. Griffin KW, Botvin GJ, Scheier LM, Diaz T, Miller NL. Parenting practices as predictors of substance use, delinquency, and aggression among urban minority youth: moderating effects of family structure and gender. Psychol Addict Behav 2000; 14(2): 174-84.
9. Horta RL, Horta BL, Pinheiro RT. Drogas: famílias que protegem e que expõem adolescentes ao risco. J Bras Psiquiatr 2006; 55(4): 268-72.
10. De Micheli D, Formigoni ML. Drug use by Brazilian students: associations with family, psychosocial, health, demographic and behavioral characteristics. Addiction 2004; 99(5): 570-8.
11. Duncan SC, Duncan TE, Strycker LA. Alcohol use from ages 9 to 16: A cohort-sequential latent growth model. Drug Alcohol Depend 2006; 81(1): 71-81.
12. Chilcoat HD, Anthony JC. Impact of parent monitoring on initiation of drug use through late childhood. J Am Acad Child Adolesc Psychiatry 1996; 35(1): 91-100.
13. Organização Mundial da Saúde. Inequalities in young people's health. Health Behavior in School-Aged Children. International Report from the 2005-2006 survey. Copenhagen: WHO, Regional Office for Europe; 2008 (Health Policy for Children and Adolescents, No. 5).
14. Guimarães AB, Hochgraf PB, Brasiliano S, Ingberman YK. Aspectos familiares de meninas adolescentes dependentes de álcool e drogas. Rev. Psiq Clín 2009; 36(2): 69-74.

15. Sale E, Sambrano S, Springer JF, Peña C, Pan W, Kasim R. Family protection and prevention of alcohol use among Hispanic youth at high risk. *Am J Community Psychol* 2005; 36(3-4): 195-205.
16. Instituto Brasileiro de Geografia e Estatística – IBGE (Brasil). Pesquisa Nacional de Saúde do Escolar - PENSE 2012. Rio de Janeiro: IBGE; 2013.
17. Siziya S, Muula AS, Rudatsikira E. Prevalence and correlates of truancy among adolescents in Swaziland: findings from the Global School-Based Health Survey *Child Adolesc Psychiatry Ment Health* 2007; 1: 15.
18. Reddy P, Resnicow K, Omardien R, Kambaran N. Prevalence and correlates of substance use among high school students in South Africa and the United States. *Am J Public Health* 2007; 97(10): 1859-64.
19. Schulte MT, Ramo D, Brown SA. Gender Differences in Factors Influencing Alcohol Use and Drinking Progression Among Adolescents. *Clin Psychol Rev* 2009; 29(6): 535-47.
20. Unger JB, Sun P, Johnson CA. Socioeconomic correlates of smoking among an ethnically diverse sample of 8th grade adolescents in Southern California. *Prev Med* 2007; 44(4): 323-7.
21. Oliveira-Campos M, Giatti L, Malta D, Barreto SM. Contextual factors associated with sexual behavior among Brazilian adolescents. *Ann Epidemiol* 2013; 23(10): 629-35.
22. Beyers JM, Toumbourou JW, Catalano RE, Arthur MW, Hawkins JD. A crossnational comparison of risk and protective factors for adolescent substance use: the United States and Australia. *J Adolesc Health* 2004; 35(1): 3-16.
23. Pokhrel P, Unger JB, Wagner KD, Ritt-Olson A, Sussman S. Effects of parental monitoring, parent-child communication, and parents' expectation of the child's acculturation on the substance use behaviors of urban, Hispanic adolescents. *J Ethn Subst Abuse* 2008; 7(2): 200-13.
24. Wagner KD, Ritt-Olson A, Chou CP, Pokhrel P, Duan L, Baezconde-Garbanati L, et al. Associations between family structure, family functioning, and substance use among Hispanic/Latino adolescents. *Psychol Addict Behav* 2010; 24(1): 98-108.
25. Bovet P, Viswanathan B, Faeh D, Warren W. Comparison of smoking, drinking, and marijuana use between students present or absent on the day of a school-based survey. *J Sch Health* 2006; 76(4): 133-7.
26. Soldera M, Dalgallarrondo P, Corrêa Filho HR, Silva CA. Uso de drogas psicotrópicas por estudantes: prevalência e fatores sociais associados. *Rev Saúde Pública* 2004; 38(2): 277-83.
27. Andrade SS, Yokota RT, Sá NN, Silva MM, Araújo WN, Mascarenhas MD, et al. Relação entre violência física, consumo de álcool e outras drogas e bullying entre adolescentes escolares brasileiros. *Cad Saúde Pública* 2012; 28(9): 1725-36.
28. La Greca AM, Prinstein MJ, Fetter MD. Adolescent peer crowd affiliation: linkages with health-risk behaviors and close friendships. *J Pediatr Psychol* 2001; 26(3): 131-43.
29. Sussman S, Dent CW, Stacy AW, Burciaga C, Raynor A, Turner GE, et al. Peer-group association and adolescent tobacco use. *J Abnorm Psychol*. 1990;99(4):349-52.
30. Machado IE, Lana FC, Felisbino-Mendes MS, Malta DC. Factors associated with alcohol intake and alcohol abuse among women in Belo Horizonte, Minas Gerais State, Brazil. *Cad Saúde Pública* 2013; 29(7): 1449-59.
31. Huurre T, Lintonen T, Kaprio J, Pelkonen M, Marttunen M, Aro H. Adolescent risk factors for excessive alcohol use at age 32 years. A 16-year prospective follow-up study. *Soc Psychiatry Psychiatr Epidemiol* 2010; 45(1): 125-34.

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