



LETTERS TO THE EDITOR

Sociodemographic, psychiatric, and personality correlates of non-prescribed use of amphetamine medications for academic performance among medical students

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Use of psychostimulants without a medical indication to supposedly improve academic performance is common among medical students, but its correlates remain poorly understood.^{1,2} In this cross-sectional study (Plataforma Brasil ethical approval 52982815.9.0000.5636), we explored sociodemographic, psychiatric, and personality factors associated with this phenomenon. Students from all semesters of two universities (A, public, and B, private) in the metropolitan area of Florianópolis (state of Santa Catarina, Brazil) were invited, at the start or the end of classes, to answer an anonymous, self-report questionnaire about methylphenidate or lisdexamfetamine use patterns, gender, living situation, household monthly income per capita, and last-month cannabis use, as well as complete the Alcohol Use Disorders Identification Test - Consumption (AUDIT-C), 4-item Patient Health Questionnaire (PHQ-4), Adult Attention-Deficit/Hyperactivity Disorder (ADHD) Self-Report Scale (ASRS), and Big Five Inventory (BFI) instruments.

Of 707 students enrolled, 698 (98.7%) completed the questions about methylphenidate or lisdexamfetamine use.

Of these, 81.8% had never used these medications, 7.0% had ever used them with a medical prescription, and 11.2% had ever used them without a prescription. Students with prescribed use were excluded due to likely ADHD. Of those with non-prescribed use, 28.2% (n=22) used in the past month (median [interquartile interval], 2.0 [1.0-6.3] days of use in this period) and 71.8% (n=56) had done so more than 1 month before (2.0 [0.0-4.0] days of use in the past year). Motivations for non-prescribed use (more than one could be endorsed) were to study longer (84.6%), increase concentration (46.2%), stay awake (28.2%), experiment (15.4%), and party (10.3%).

First, we performed preliminary analyses (Mann-Whitney or chi-square tests) comparing students with non-prescribed use for academic performance (to study longer, increase concentration, or stay awake; n=71, or 10.2% of the sample) to students without use (n=571). Non-prescribed use for academic performance was significantly associated ($p < 0.05$) with studying in University B, older age, last-month cannabis use, higher AUDIT-C and lower BFI conscientiousness scores, and screening positive in the ASRS (score of 24 or greater in part A or B). We then simultaneously entered these variables into a multiple logistic regression model to define independent significant associations (Table 1).

Assumptions: numerical variables met the logit linearity assumption in the Box-Tidwell test ($p > 0.05$); no numerical variables showed a tolerance < 0.1 or a variance inflation factor > 5 ; no cases had a Cook's distance > 1 ; 15 cases had an absolute standardized residual > 3 ; an analysis excluding these cases improved model fit (Hosmer-Lemeshow $p = 0.74$; Nagelkerke's $R^2 = 0.35$; $c = 0.88$), but did not change significance patterns.

Although many studies have addressed non-prescribed use of psychostimulant medication among medical students, ours was novel in its broad exploration of factors independently associated with this phenomenon. For example, very few studies in university students took personality measures into account.³ Prevalence of non-prescribed use was similar or somewhat lower in our sample than in other studies,^{1,2} and most students reported sporadic use. The associations with cannabis

Table 1 Multiple logistic regression model for the outcome of non-prescribed use of methylphenidate or lisdexamfetamine to enhance academic performance among medical students

Outcome: No, n=521; Yes, n=63; Total, n=584; Missing, n=58


Summary: Hosmer-Lemeshow p-value = 0.06; Nagelkerke's $R^2 = 0.17$; $c = 0.76$

Explanatory variables	Regression coefficient	AOR (95%CI)	p-value
Age	0.09	1.09 (1.03-1.16)	0.003
University	1.31	3.70 (2.03-6.72)	0.00002
ASRS positive	0.30	1.35 (0.68-2.69)	0.39
AUDIT-C	0.18	1.20 (1.05-1.36)	0.006
Cannabis use in the past month	0.71	2.04 (1.05-3.97)	0.04
BFI conscientiousness	-0.25	0.78 (0.49-1.23)	0.28
Constant = -5.04			

95%CI = 95% confidence interval; AOR = adjusted odds ratio; ASRS = Adult ADHD Self-Report Scale; AUDIT-C = Alcohol Use Disorders Identification Test - Consumption; BFI = Big Five Inventory.

and alcohol consumption are in line with previous research and consistent with the idea that psychostimulant misuse may reflect a general tendency for greater substance use.⁴ In addition, the association with the variable university is consistent with the notion that psychostimulant misuse patterns vary widely locally and regionally.² Overall, these results suggest it is reasonable to devise strategies to address psychostimulant misuse that take local factors (institutional or cultural, for example) into consideration, and following the same broad lines of strategies targeting other substances.⁵

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Tourette's disorder and sexual offenses: psychiatric-forensic considerations

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A clinical condition characterized by multiple, persistent motor and/or vocal tics, present to a variable extent since childhood, was first described in the 19th century. First known as Gilles de la Tourette syndrome, it is now included in DSM-5 as Tourette's disorder. With a prevalence of 3 to 8 cases per 1,000 school-age children, it is more frequent in males; symptoms usually begin between 4 and 6 years of age, worsen in pre-adolescence, and may decline in adolescence.¹ Changes in the cortico-striatal-thalamic circuitry² promote executive dysfunctions, impaired impulse control, and impaired inhibition of undesirable behaviors.³ Anxious factors exacerbate the symptomatology.⁴ Obsessive-compulsive disorder (OCD) and attention deficit hyperactivity disorder (ADHD) are the most prevalent comorbidities and the most important differential diagnoses, along with tourettism (Tourette's-like symptoms secondary to brain injury).

Rarely does Tourette's disorder per se lead to criminal behavior, although comorbidities, anger episodes secondary to obsessive ruminations of intrusive thoughts, and motor (copropraxia, coprography) and verbal (coprolalia) inadequacies may increase this risk.³ There is no lack of empathy as found in antisocial personality. The modest specialized literature concerning the clinical specificities of Tourette's disorder and associated legal issues demonstrates that these patients are frequently found guilty when charged with offenses.^{3,5,6} We will share our considerations about a case evaluated at Instituto Psiquiátrico Forense Doutor Maurício Cardoso, in Porto Alegre, southern Brazil.

At age 35, the patient was indicted for statutory rape after he impulsively kissed the mouth and caressed the genitals of a neighbor's child in front of the child's mother. During childhood, the patient had exhibited restless and disruptive behavior secondary to impulsivity. From the age of 7, he developed checking and symmetry obsessive-compulsive symptoms and motor tics, which included touching feces; he ultimately received a diagnosis of Tourette's disorder with comorbid OCD. During adolescence, the patient's neuropsychiatric symptoms worsened. He became unable to manage his self-care, began pharmacotherapy (haloperidol), and was hospitalized for dosage adjustments at age 12. The patient had an impoverished relationship life, was somewhat infantilized and dependent on relatives. He denied paraphilias of any order, coprolalia, or psychotic experiences. Currently, he reported obsessive rituals as well as sensory phenomena related to touching: "like an intuition [...]. I usually can't control" (*sic*).