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Analysis of the prevalence and profile of use of psychotropic medicines in medical students at a university in the extreme south of Santa Catarina

Análise da Prevalência e Perfil do Uso de Medicamentos Psicotrópicos em Estudantes de Medicina em uma Universidade do Extremo Sul Catarinense

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Abstract

Introduction: Medical students are exposed to stressful situations, which can lead to the search for psychotropic medications, therefore, the present study aims to analyze the prevalence and profile of use of psychotropic medications in medical students from a University in the Extreme South of Santa Catarina. **Methods:** This is an analytical, cross-sectional observational study with a quantitative approach and primary data collection. Data were collected from 273 medical students from all phases, regularly enrolled in the 1st semester of 2023 at a University in the Extreme South of Santa Catarina, through a questionnaire via Google Forms, containing 14 questions related to the epidemiological profile of the participants and the profile of medication use by students who used psychotropic drugs. **Results:** Among the medical students analyzed, 41.4% used some type of psychotropic medication. Among the medications, the most used was the antidepressant class, with 77%. 9.7% used the medication without formal indication. A significant relationship was found between the use of psychotropic medications and psychological counseling. Only 39.8% started using psychiatric medications before entering medical school. **Conclusion:** The present study identified a high percentage of medical students using psychotropic medications, which indicates the need for strategies to control the inappropriate use of psychotropic drugs, as well as to control the factors that lead students to seek such medications.

KEYWORDS: Psychotropic drugs; medical students; antidepressants; psychostimulants; excessive stress.

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Resumo

Introdução: Acadêmicos de medicina estão expostos a situações de estresse, o que pode levar a busca por medicamentos psicotrópicos, portanto, o presente estudo visa analisar a prevalência e o perfil de uso de medicamentos psicotrópicos em estudantes de medicina de uma Universidade do Extremo Sul Catarinense. **Métodos:** Estudo observacional analítico transversal, com abordagem quantitativa e coleta de dados primários. Foram coletados dados de 273 acadêmicos de Medicina de todas as fases, regularmente matriculados no 1º semestre de 2023 de uma Universidade do Extremo Sul Catarinense, através de um questionário via Google Forms, contendo 14 questões relacionadas ao perfil epidemiológico dos participantes e perfil de uso de medicamentos pelos acadêmicos que faziam uso de psicofármacos. **Resultados:** Entre os estudantes de medicina analisados, 41,4% utilizavam algum tipo de medicamento psicotrópico. Dentre as medicações, a mais utilizada foi a classe dos antidepressivos com 77%. 9,7% faziam uso da medicação sem indicação formal. Foi encontrada uma relação significativa entre o uso de medicamentos psicotrópicos e acompanhamento psicológico. Apenas 39,8% iniciaram o uso de medicações psiquiátricas antes de entrar no curso de medicina. Conclusão: O presente estudo identificou uma alta porcentagem de estudantes de medicina em uso de medicamentos psicotrópicos, o que indica a necessidade de estratégias para o controle do uso inadequado de psicofármacos, bem como o controle dos fatores que levam os acadêmicos a buscarem tais medicações.

PALAVRAS-CHAVE: Medicamentos psicotrópicos; estudantes de Medicina; antidepressivos; psicoestimulantes; estresse excessivo.

Introduction

Medical students typically experience high levels of perceived stress due to extensive academic hours, lack of leisure time, and constant exams and tests in a competitive environment[5]. Due to exposure to various stressors, medical students are compelled to develop coping skills and strategies to manage daily challenges during their training[6]. Coping refers to individual cognitive and behavioral strategies used to improve, reduce, or tolerate the demands of stressful situations, and these strategies can be either positive or negative[7].

In the context of medical training, there are increased demands regarding academic performance, responsibility, and commitment to the course[8]. Students are often exposed to high levels of stress, social isolation, sleep deprivation, and competitive situations[9]. The fact that they are studying in the field contributes to the use of psychotropic medications without professional guidance, a practice that tends to become more common as students advance in their studies[10]. Even in the first year of medical school, students show a decline in psychological well-being[11]. Brazilian studies have shown that one in three medical students exhibits depressive symptoms[12]. These factors significantly impact students' academic lives, as high levels of anxiety and depression are associated with poorer academic outcomes[13].

To better manage the symptoms arising from daily challenges and to improve academic performance, medical students increasingly turn to psychotropic medications. Therefore, it is crucial to investigate the abusive or inappropriate use of psychotropic medications, which will help in proposing solutions to address the problem. This study aims to analyze the prevalence and profile of psychotropic medication use among medical students at a university in the Extreme South of Santa Catarina.

Methods

Study design and population

This is a cross-sectional analytical observational study with a quantitative approach and primary data collection. Medical students enrolled in the first semester of 2023 in a private institution, named University of The Extreme South of Santa Catarina (UNESC) were evaluated.

Sample procedures and data collection

The minimum sample size was calculated using the formula proposed by Medronho[14].

$$n = \frac{z_{\frac{\alpha}{2}}^2 NP(1-P)}{\varepsilon^2(N-1) + z_{\frac{\alpha}{2}}^2 P(1-P)}$$

Where: z (1.96) refers to the two-tailed standardized normal statistic associated with the α value (0.05); P (0.50) is the value that maximizes the sample size; α (0.05) is the maximum tolerable sampling error; N (1,036) is the population to be sampled; and n refers to the minimum sample size, which resulted in 273 students.

$$n = \frac{z_{\frac{\alpha}{2}}^2 NP(1-P)}{\varepsilon^2(N-1) + z_{\frac{\alpha}{2}}^2 P(1-P)}$$

A questionnaire was administered via Google Forms, developed by the researchers to assess the prevalence and profile of psychotropic medication use among the participating medical students. The questionnaire consisted of 14 questions, addressing variables such as gender, age, ethnicity, religion, stage of the medical course, living situation, regular psychological counseling, and regular physical activity. Additionally, participants were asked about their use of medications, which medication they used, the symptom that led to its use, whether the medication was used continuously, whether there was a formal indication for its use, and at what stage of the course the medication was initiated (Supplementary Material 1).

Datta analysis

The collected data were analyzed using IBM Statistical Package for the Social Sciences (SPSS) version 23.0. Quantitative variables were expressed as means and standard deviations. Qualitative variables were expressed as frequencies and percentages.

Statistical tests were conducted with a significance level of $\alpha = 0.05$, corresponding to a 95% confidence level. The normality of quantitative variables was assessed using the Shapiro-Wilk test. The association between qualitative variables was investigated using Pearson's Chi-Square and Likelihood Ratio tests, followed by residual analysis when statistical significance was observed. The comparison of means for quantitative variables between categories of dichotomous qualitative variables was conducted using the Mann-Whitney U test.

Ethics statements

This study was approved by the Research Ethics Committee of the University of the Extreme South of Santa Catarina, under protocol number 6.082.148. Before the interview began, the participant signed the Informed Consent Form.

Results

During the data collection period, 273 students completed the questionnaire on Google Forms. These students were regularly enrolled in the Medicine program at the University of the Extreme South of Santa Catarina, located in Criciúma-SC.

Table 1. Epidemiological Profile of Study Participant. SD = Standart deviation; n = total number of students.

	Mean ± SD or n (%)
	n = 273
Age (Years)	22,52 ± 3,33
Sex	
Female	193 (70,7)
Male	80 (29,3)
Skin Color	
White	265 (97,1)
Brown	6 (2,2)
Black	1 (0,4)
Yellow	1 (0,4)
Current Course Phase	
Basic Cycle (1st to 4th Semester	105 (38,5)
Clinical Cycle (5th to 8th Semester)	105 (38,5)
Internship (9th to 12th Semester)	63 (23,1)
Religion	
Catholic	153 (56,0)
Atheist	59 (21,6)
Protestant	27 (9,9)
Spiritist	18 (6,6)
African Matrix Religion	3 (1,1)
Other	13 (4,8)
Housing	
With parentes	134 (49,1)
Alone	71 (26)
With a colleague	41 (15)
With another relative	27 (9,9)
Undergoing Psychological Counseling	
Yes	103 (37,7)
No	170 (62,3)
Regular Physical Activity	
Yes	179 (65,6)
No	94 (34,4)

In Table 1, it can be inferred that the study participants had a mean age of 22.53 ± 3.33 years, and regarding gender, 70.7% were female. In terms of ethnicity, 97.1% were White. Concerning the phase of the course at the time of data collection, it was observed that 38.5% of the students were in the Basic Cycle, 38.5% in the Clinical Cycle, and 23.1% in the Internship. Additionally, 56% of the students reported being Catholic, and 49.1% lived with their parents. Among the analyzed students, 37.7% were undergoing regular psychological counseling, and 65.6% engaged in regular physical activity.

Table 2. Profile of psychotropic drug use among medical students

	N	n (%)
Uses medication	273	
Yes		113 (41,4)
No		160 (58,6)
*Medications**	113	
Antidepressants		87 (77,0)
Psychostimulants		25 (22,1)
Benzodiazepines		12 (10,6)
Mood stabilizers		12 (10,6)
Sleep inducers		6 (5,3)
Antipsychotics		8 (7,1)
Symptoms motivating medication use	113	
Excessive stress		29 (25,7)
Excessive worry		24 (21,2)
Anhedonia		22 (19,5)
Difficulty concentrating		21 (18,6)
Sleep disorders		11 (9,7)
Academic improvement		5 (4,4)
Not reported		1 (0,9)
Continuous use	113	
Yes		102 (90,3)
No		11 (9,7)
Has a formal indication	113	
Yes		102 (90,3)
No		11 (9,7)

	N	n (%)
Medication start phase	113	
Before starting the course		45 (39,8)
Basic cycle (1st to 4th semester)		35 (31,0)
Clinical cycle (5th to 8th semester)		30 (26,5)
Internship (9th to 12th semester)		3 (2,7)

**An individual may use more than one type of medication.*

In Table 2, by examining the profile of medical students using psychotropic medications, it was identified that 41.4% of the study participants used such drugs. Regarding the psychiatric medications used: 77% of the students on psychiatric medications were taking antidepressants, 22.1% were using psychostimulants, 10.6% benzodiazepines, 10.6% mood stabilizers, around 7.1% were using antipsychotics, and 5.3% sleep inducers.

Analyzing the symptoms that led to the use of medications, it was identified that excessive stress accounted for 25.7% of the motivations, followed by excessive worry at 21.2%, 19.5% anhedonia , 18.6% difficulty concentrating, 9.7% sleep disorders, 4.4% a desire for academic performance improvement, and 0.9% did not report the reason for using the medication. Continuing with the analysis of usage patterns, it was inferred that 90.3% of medical students used psychotropic medications continuously, and 90.3% had a formal indication for use. Regarding the phase when medication use began, 39.8% started before medical school, 31% during the Basic Cycle, 26.5% in the Clinical Cycle, and 2.7% during the Internship.

In Table 3, the epidemiological profile of medical students who use psychotropic drugs was analyzed. It was possible to infer a statistically significant relationship between the use of psychiatric medications and regular psychological follow-up ($p < 0.001$). Additionally, regarding the data in Table 3, no statistical significance was identified when comparing the use of psychomodulatory substances with, age, gender, skin color, and

housing. The relationship between drug use and physical activity practice was also not statistically significant. The analysis of the relationship between the use of psychotropic drugs and the current stage of the course of the participating students did not show statistical relevance.

Table 3. Association between psychotropic drug use and the epidemiological profile of the study participants

	Psychotropic Drug Use, Mean ± SD, n (%)		p-value
	Yes	No	
	n = 113	n = 160	
Age (Years)	22,91 ± 3,12	22,24 ± 3,46	0,109**
Gender			
Female	87 (77,0)	106 (66,3)	0,055**
Male	26 (23,0)	54 (33,8)	
Skin Color			
White	111 (98,2)	154 (96,3)	0,207**
Brown	1 (0,9)	5 (3,1)	
Black	1 (0,9)	0 (0,0)	
Yellow	0 (0,0)	1 (0,6)	
Religion			
Catholic	60 (53,1)	93 (58,1)	0,552***
Atheist	24 (21,2)	35 (21,0)	
Protestant	10 (8,8)	17 (10,6)	
Spiritist	9 (8,0)	9 (5,6)	
African Matrix Religion (Umbanda, Candomble)	2 (1,8)	1 (0,6)	
Other	8 (7,1)	5 (3,1)	
Housing			
With parentes	52 (46,0)	82 (51,3)	0,204*
Alone	36 (31,9)	35 (21,9)	
With a colleague	13 (11,5)	28 (17,5)	
With another family member	12 (10,6)	15 (9,4)	
Psychological Follow-up			
Yes	63 (55,8)[b]	40 (25,0)	< 0,001*
No	50 (44,2)	120(75,0)[b]	

	Psychotropic Drug Use, Mean ± SD, n (%)		p-value
	Yes	No	
	n = 113	n = 160	
Regular Physical Activity			
Yes	69 (61,1)	110 (68,8)	0,188*
No	44 (38,9)	50 (31,3)	
Current Course Stage			
Basic Cycle (1st to 4th semestre)	39 (34,5)	66 (41,3)	0,515*
Clinical Cycle (5th to 8th semester)	47 (41,6)	58 (36,3)	
Internship (9th to 12th semester)	27 (23,9)	36 (22,5)	

*** Value obtained after applying the Mann-Whitney U test; * Values obtained after applying Pearson's Chi-square test; ** Values obtained after applying the Likelihood Ratio test; b Statistically significant value after residual analysis;*

Discussion

The percentage of medical students using psychotropic medications in the present study was 41.4%. In another quantitative study conducted at a university in Goiás, it was observed that 46% of medical students either currently use or have used psychiatric medications.[15] This figure is higher when compared to the general population's use of psychotropic drugs, as noted in two population-based cross-sectional studies conducted in the municipalities of Campinas-SP and Pelotas-RS, which found percentages of neuromodulator medication use of 11.7% and 9.7%, respectively[16,17]. It should be noted that the present study was conducted at a private university, and that medical students generally have better financial conditions, as well as access to medications and medical professionals, compared to the general population.

Regarding the reasons for using psychiatric medications, it was found that excessive stress (25.7%), anxious symptoms (21.2%), anhedo-

nia(19.5%), and difficulty concentrating (18.6%) were the main drivers for medical students to seek psychotropic drugs. This can be justified as medical students often experience high levels of perceived stress due to the heavy academic workload, lack of leisure time, and constant exams and tests in a competitive environment[18]. The data from this article align with the scientific literature, as a quantitative-qualitative study conducted at a medical university between August 2016 and March 2017 found that academic pressure was the biggest concern reported by students when asked about the reasons for facing psychological stress. Almost all participants mentioned that the vast amount of information and the high demands of the course were the main causes of mental stress[19]. When comparing international data, 30% of medical students in Europe suffer from anxiety or depression[20,21]. In Brazil, between 20% and 50% of medical students face some form of mental disorder[22].

Analyzing the main medications used, it was found that 77% of medical students using psychiatric medications were taking antidepressants, which may be related to the aforementioned motivating factors. Moreover, antidepressants are the most prescribed psychiatric medications in the general population, being indicated for the treatment of anxiety and/or depressive symptoms[23].

This study also found that 22.1% of medical students using psychiatric medications were taking psychostimulants, predominantly Ritalin (methylphenidate) and its derivatives. This is consistent with the literature, as the rates of students using cognitive-enhancing drugs range from 5.2% to 47.4% in different countries[24]. This class of medication is widely used in the treatment of ADHD, a disorder with a prevalence in adults aged 19 to 45 estimated to be between 2% and 5% of the general population, according to a meta-analysis[25]. This raises the hypothesis of overdiagnosis of ADHD among university students who may not actually have the neurocognitive

disorder, or it could indicate that these students are using the medication for cognitive enhancement, seeking better academic performance. This pursuit is driven by the highly competitive environment and the pressure to perform in tests and exams, without considering the drug's deleterious effects on long-term memory consolidation. Additionally, exposure to psychostimulants can lead to insomnia, which may subsequently result in decreased performance, prompting students to increase their drug use, exposing them to the risk of abuse and dependence[26,27].

Furthermore, in this study, among the students using psychotropic medications, 10.6% were using benzodiazepines, a sedative medication used to treat anxiety crises and insomnia, with a potent sedative effect and a risk of dependence. Comparatively, a qualitative study conducted among medical students at a university in southern Tocantins found that 18% of students reported using the drug[28]. In another study conducted at a university in São Paulo, the rates were 19%[29]. However, the harmful effects of long-term use of benzodiazepines are well-documented in the literature, potentially leading to memory impairment and dependence[30,31]. These effects could be even more pronounced in medical students, who enter university at a young age and may start using the medication early in life, exposing themselves to the risk of prolonged abuse and dependence on the drug.

When analyzing the relationship between physical exercise and the use of psychiatric medications, no significant correlations were found in the present study. However, it is well known that physical exercise is a great ally in improving mental health, with studies demonstrating that physical activity helps reduce stress and anxiety, improves sleep quality, and promotes well-being[32,33].

In the present study, 39.8% of medical students started using psychiatric medications before entering medical school, while the others began at some

point during their studies. Other data were found in an observational cross-sectional study conducted in São Paulo, where 69% of medical students had started using psychotropic drugs at some point during the course[34].

Among those using psychiatric medications, the present study found that 5.2% of students were using sleep aids. In a descriptive cross-sectional study conducted with medical students at a federal university in Campina Grande, 3% of respondents were found to be using sleep aids, all of them taking Zolpidem[35]. It is worth noting that Zolpidem was the most searched drug on a medication consulting platform after the COVID-19 pandemic, as demonstrated in a review study on the increase in drug consumption post-pandemic. It should also be noted that adverse effects such as cognitive impairment, hallucinations, and imbalance have been reported with its use[36].

Regarding formal indications for the use of psychotropic drugs by medical students, 90.3% of students reported having a prescription for the medication, while 9.7% obtained psychotropic drugs through self-medication. In a study conducted with medical students in Greece, the rate of self-medication was 10.7%[37]. Additionally, in a cross-sectional study conducted in Saudi Arabia, 3.5% of medical students were found to be using psychotropic drugs on their own[38]. This shows that the self-medication rates in the present study are similar to those found in other countries' literature.

When analyzing the regular psychological care received by medical students using psychotropic medications, the research showed that 55% of these students were receiving psychological assistance. A similar analysis can be seen in a cross-sectional study conducted with students at a university in Minas Gerais, where students with burnout syndrome were approximately twice as likely to receive psychological care compared to those without the disorder[39]. This comparison suggests that psychological distress leads to a greater pursuit of psychological support, use of psy-

chiatric medications, as well as follow-up with formal indication, rather than self-medication, among the medical students analyzed.

Based on the observed results, it is possible to identify a high percentage of medical students who use psychiatric medications, with antidepressants and psychostimulants being the most prominent. It can also be inferred that the primary reason for seeking these medications was excessive stress, and there is a significant relationship between psychological care and the use of psychotropic drugs. Furthermore, only 39.8% began using these medications before entering medical school.

Therefore, the authors emphasize the importance of increased psychological support in medical universities, at all stages, as well as promoting a more cooperative and less competitive environment, aiming to train competent professionals without compromising the mental health of future doctors. Furthermore, more studies are needed to expand knowledge on the topic, potentially focusing on a larger number of participants, in both public and private universities and their realities, as well as emphasizing and seeking solutions for the issues addressed.

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Diclosure

The authors declare no conflict of interest in conducting this research.

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