ORIGINAL ARTICLE

REVISTA ENFERMAGEM ATUAL IN DERME

USE OF CENTRAL NERVOUS SYSTEM STIMULATORS BY HEALTH SCIENCE STUDENTS IN THE PERNAMBUCO DRYLANDS AREA

USO DE ESTIMULANTES DO SISTEMA NERVOSO CENTRAL POR ESTUDANTES DE SAÚDE DO SERTÃO DE PERNAMBUCO

Gustavo da Silva Cândido[1] * João Paulo da Silva Teixeira[2] * Larissa Gabrielle Torres Príncipe[3] * Maria Viviane Mariano Terto[4] * Vitória Mayane Amorim Roque[5] * Viviane da Silva Lima[6] * Gabriela Cavalcante da Silva[7]

ABSTRACT

Introduction: Psychostimulants are substances capable of acting on the brain, producing effects by modulating synaptic transmission, stimulating or inhibiting some neurotransmitters. Its main pharmacological effects have a role on mood and wakefulness, in addition to increasing alertness and cognitive improvement. They have been used by individuals who have no neuropsychiatric or cognitive disorders. **Objective:** To evaluate the use of central nervous system stimulants by health students in the municipality of Serra Talhada - PE. Methodology: Cross-sectional study, with a quantitative approach with 325 health students from the Faculty of Integration of the Sertão, Serra Talhada. For data collection, a self-structured questionnaire was used, using the Google form. **Results:** There was a high rate of academics who self-medicate 71.1% (n = 231). Of the 325 students, 69.84% (n = 227) reported that they had already used some psychostimulant such as hypnotic, Ginkgo biloba, ritalin (methylphenidate), energy drink and caffeine to assist in the routine of studies. **Conclusion:** The irrational use of psychotropic drugs in the academic context is growing, and it should be considered a public health problem, especially in view of the risks of damage and adverse adverse effects on mental and physical health associated with its use. Investigations must be developed in order to make the problem sizing feasible, supporting actions to prevent damage and dependence related to this class of medication.

Keywords: Mental health. Self-medication. Central Nervous System Stimulants.

RESUMO

Introdução: Os psicoestimulantes são substâncias capazes de atuar no cérebro, produzindo efeitos ao modular a transmissão sináptica, estimulam ou inibem alguns neurotransmissores. Seus efeitos farmacológicos principais exercem função sobre o humor e estado de vigília, além de aumentar o estado de alerta e aprimoramento cognitivo. Eles têm sido usados por indivíduos que não possuem nenhum distúrbio neuropsiquiátrico ou cognitivo. **Objetivo:** Avaliar o uso de estimulantes do sistema nervoso central por estudantes de saúde do município de Serra Talhada – PE. **Metodologia:** Estudo transversal, com abordagem quantitativa com 325 estudantes de saúde da Faculdade de Integração do Sertão, Serra Talhada. Para a coleta de dados, utilizou-se um questionário auto aplicativo estruturado, via formulário Google. **Resultados:** Houve um alto índice de acadêmicos que se automedicam 71,1% (n=231). Dos 325 estudantes, 69,84% (n=227) relataram que já fizeram uso de algum psicoestimulante como hipnótico, *Ginkgo biloba*, ritalina (metilfenidato), bebida energética e cafeína para auxiliar na rotina dos estudos. **Conclusão:** O uso irracional de psicofármacos no âmbito acadêmico crescimento é crescente, e deve ser considerado problema de saúde pública, principalmente diante dos riscos de danos e efeitos adversos prejudiciais à saúde mental e física associados ao seu uso. Investigações devem ser desenvolvidas a fim de viabilizar o dimensionamento do problema, subsidiando ações de prevenção aos danos e dependência relacionados a esta classe de medicamento.

Palavras-chave: Saúde mental. Automedicação. Estimulantes do Sistema Nervoso Central.

[1] Enfermeiro pela Faculdade de Integração do Sertão-FIS. Residente em Saúde Coletiva com ênfase em Agroecologia (Universidade de Pernambuco/Instituto Aggeu Magalhães). E-mail: gustavocandidogu@gmail.com Orcid: https://orcid.org/0000-0002-3505-3634
[2] Enfermeiro pela Faculdade de Integração do Sertão-FIS. E-mail: joaopaulo77teixeira@gmail.com Orcid:https://orcid.org/0000-0002-1282-9903
[3] Enfermeira pela Faculdade de Integração do Sertão-FIS. E-mail: gabriellyprincipe@hotmail.com Orcid: https://orcid.org/0000-0002-3505-3634
[4] Enfermeira pela Faculdade de Integração do Sertão-FIS. E-mail: tertoviviane1998@gmail.com Orcid:https://orcid.org/0000-0002-2432-8727
[5] Enfermeira pela Faculdade de Integração do Sertão-FIS. E-mail: vitoriamayaneamorim@outlook.com Orcid: https://orcid.org/0000-0003-0412-6973
[6] Farmacêutica Generalista pela Faculdade de Integração do Sertão-FIS. Esp. em Gestão Clínica do Medicamento pela Universidade Cruzeiro do Sul-UNICSUL. E-mail: limmavivianne@gmail.com Orcid: https://orcid.org/0000-0003-0412-6973
[7] Mestre em Ciências Farmacêuticas – UFPE. Doutora em Bioquímica e Fisiologia – UFPE. Docente da Faculdade de Integração do Sertão – FIS. E-mail: gcavalcante1988@gmail.com Orcid: https://orcid.org/0000-0003-3390-6645

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INTRODUCTION

Psychostimulants are substances that act on the central nervous system (CNS), producing effects by modulating synaptic neurotransmission. In general, their main pharmacological stimulant effects play a role in mood and wakefulness, in addition to increasing productivity power, allowing for greater alertness and cognitive enhancement. The main substances used for this purpose are caffeine, methylphenidate, modafinil, various energy drinks, amphetamines, among others [1].

Self-medication is understood as an individual's initiative to ingest drug-active substances without the guidance or monitoring of a qualified health professional. The individual can have access to the drug either by buying it without the proper prescription or using expired prescriptions, among other ways. The use of medications on their own is a frequent habit that transcends technical-scientific knowledge, aiming to solve any health-related problem, either through treatment for cure or relief of some discomfort, often without a properly established diagnosis [2,3].

Self-medication with methylphenidate as a pharmacological cognitive improvement practice is part of the lives of many university students. This needs to be understood and faced as a public health problem due to exposure to risks of damage and adverse effects associated with the physical and mental health of academics in Health Science courses [4].

The practice of consumption of brain stimulants among university students in the Health Sciences area should be less prevalent, as these individuals have access to disciplines that cover scientific knowledge on the subject. However, the individual's accumulation of general knowledge, added to life experience, can lead to self-confidence to self-medication, as occurs among some health professionals [5].

Related to misuse and sometimes irrational is the problem of chemical dependency, characterized by continuous, exaggerated use as well as tolerance to some type of substance, where social and cultural means can also encourage this practice, generating negative consequences. A health professional who is dependent on some type of drug, for example, exposes their patients to greater risks, as their skills and judgment might be impaired [6].

The components present in energy drinks can lead to several side effects such as cramps, kidney failure, dependence, liver failure, weight gain, insomnia, tachycardia, dehydration, excessive agitation. This is the reason why one should be aware of the frequency of drinking these beverages and pay attention to the signs of the body, as there may be intoxication [7]. Short-term methylphenidate can reduce appetite and insomnia and cause abdominal pain, high blood pressure, and headaches. In the long term, the most important effects are dependence, psychological problems, and cardiovascular effects [8].

From the above, given this reality and the lack of information in this context, it is relevant to evaluate the use of central nervous system stimulants by health students in the city of Serra Talhada - PE. It is worth noting that this type of study can be useful to identify the need for interventions to make this population aware of the need to adopt safe and healthy habits in terms of studies and professional life. Therefore, more studies and actions on this topic are needed, due to the complexity that involves mental health in this political-social context and the need for a multidisciplinary approach. This paper presents a proposal for intervention in care and preservation, aiming to protect the mental

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health of those who can be harmed by the erroneous practice of self-medication.

MATERIALS AND METHODS

This cross-sectional study, with a quantitative approach, was carried out through the online application of the collection instrument to students in the health area of the Sertão Integration Faculty - FIS, Rua João Luiz de Melo, 2110 - Tancredo Neves, Serra Talhada - PE, 56909-205, from August to October 2020, upon proper authorization from the institution's directors and after deliberation by the ethics committee, through protocol number CAAE: 36968820.6.0000.8267 and opinion: 4,357,338.

The FIS institution is located in the municipality of Serra Talhada, located in the Pernambuco drylands area, at a distance of 415 km from the capital of Pernambuco, Recife. The municipality has an estimated population of 86,350 thousand inhabitants (2019) according to the panorama of the Brazilian Institute of Geography and Statistics (IBGE, 2019). This institution has 1,305 (one thousand three hundred and five) students with active enrollment in the health center, semester 2020.2. The sample consisted of Health Sciences students covering seven courses, which were: Nursing, Physiotherapy, Pharmacy, Physical Education, Nutrition, Dentistry, and Psychology. Statistically, the sample of this work was composed by 325 (two hundred and eighty-one) undergraduate students.

Included in this study were students duly enrolled in the educational institution, in the Health Sciences area, individuals of both sexes, who spontaneously agreed to participate in the research, by signing the Free and Informed Consent Term - FICT, which was made available virtually in the first section of the Google Forms that also contained the collection instrument. Students under 18 years of age were excluded from the research, as well as those who, by chance, are carriers of Attention Deficit Hyperactivity Disorder (ADHD).

The variables included in the collection instrument were gender, age, period of the undergraduate course, knowledge about the effectiveness of psychostimulants, frequency of use, side effects presented, whether there was an indication by a health professional, what types of brain stimulants were consumed the most, and if they were aware of the risks that this practice could bring. Such collection instruments, as well as the IC, made in digital format, were made available to students through the WhatsApp groups of the institution's student groups. The software used was GraphPad Prism version 8.0 and it was used to tabulate analytical statistics and to present data. The results were arranged by the program, using the frequency (%) and average.

RESULTS AND DISCUSSION

Of the 325 questionnaires collected, 26.5% (n=86) of the students are between 18-20 years old, (66.12) (n=215) between 21-30 years old, 6.2% (n=20) between 31 -40 years, 0.9% (n=3) between 41-50 years and in the group above 51 years, 0.3% (n=1) was recorded. The volunteers were concentrated between 21-30 years 66.15% (n=215) (Chart 1A). The gender of respondents was more prevalent among females, representing 76.9/% (n = 250) of the students, whereas males represented 23.1% (n=75) (Chart 1B).

In a recent study, 200 questionnaires were applied to university students at the Federal University of Rio Grande - Rio Grande do Sul, females represented 60.2% (n = 118) of the students, and the mean age was

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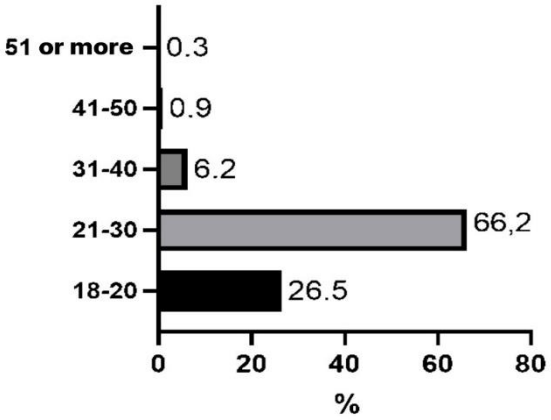
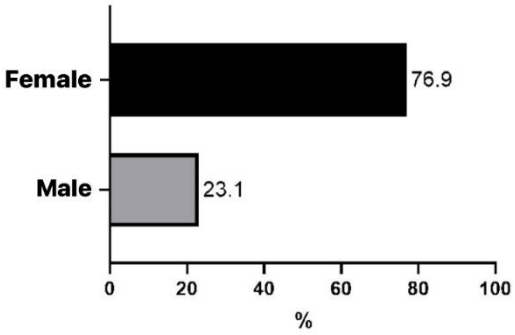
23.3 years (SD = 4.1), with 46.2% (n = 91) of students between 22 and 25 years old. At the Federal University of Minas Gerais, 378 students were included (1). The average age of the responding students was 27.9 years (SD = 8.2) and women also represented the majority of the sample (64%) [4].

Chart 1 – Age (A) and gender (B) of health students at the Sertão Integration Faculty (FIS institution), Serra Talhada, 2020.

A



B



Source: The authors

Regarding the marital status of the interviewed students, 87.69% (n=285) declared to be single, representing the majority. Married people represent 9.23% (n=30) of those who participated in the survey, in addition to 2.77% (n=9) divorced and only 0.31% (n=1) widowed. (Chart 2) shows the distribution of students participating in the study in their respective courses, with the participation of pharmacy students 30.15% (n=98) and nursing 28.31% (n=92) prevailing.

At a higher education institution in the Federal District, 144 students participated in a survey. This research was carried out with students from several higher education courses, and pharmacy students had a higher percentage of participation, totaling 48% (n = 69) and nursing 16% (n = 23) [9].

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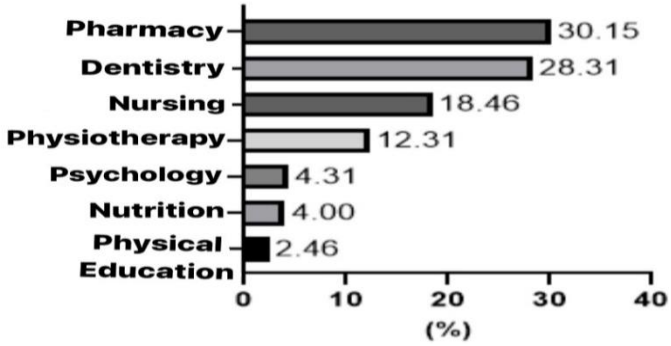
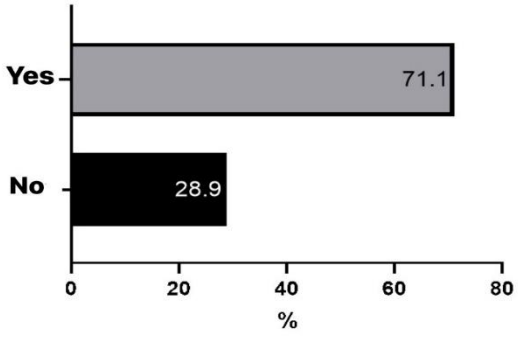
Chart 2 - Course of health students interviewed at the Sertão Integration Faculty, Serra Talhada, 2020.



Source: The authors

As illustrated in Chart 3, 71.1% (n=231) of the students responded that they usually use medication without a prescription from a health professional. This result corroborates a study carried out with physiotherapy students at a private institution - Triângulo University Center (UNITRI) in Minas Gerais, where it was found that 94.43% of respondents said they had already used or purchased medication without a prescription. Among the main reasons/diseases that lead to self-medication, 31.30% responded to headache, and the other highest frequencies obtained are in diseases such as cold, fever, and throat infection, however always accompanied by headache [10].

Chart 3 – Respondents who usually use over-the-counter medication, Sertão Integration College, Serra Talhada, 2020.



Source: The authors

Brazil occupies the fifth position among the countries that consume medicines the most, configuring the first place in Latin America. Using over-the-counter medication, for self-care, can have beneficial results for the individual, such as the improvement of symptoms, resolution of health problems, but at other times it can be harmful to the individual's health and may mask health problems, cause intoxication, reactions adverse effects, drug interactions, development of resistance, among others [11].

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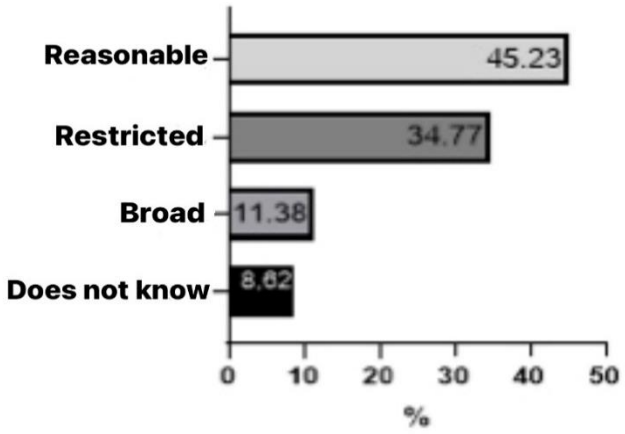
Regarding the degree of knowledge about psychostimulants, 11.38% (n=37) of respondents answered that they have broad knowledge, 45.23% (n=147) reasonable knowledge, 34.77% (n=113) answered that they have restricted knowledge, and 8.62% (n=28) are unaware of this subject (Chart 4 A). The indiscriminate use of these drugs has been increasingly discussed in several countries, as, nowadays, the fast pace and lifestyle lead the population, especially students and health professionals, to experience stressful and difficult situations. One of the options adopted refers to the use of psychoactive substances (PAS), as an attempt to alleviate or reduce stress and fatigue [12].

Chart 4 – Degree of knowledge about psychostimulants (A) and use of some medication to help in study (B) by the health students interviewed at the Sertão Integration Faculty, Serra Talhada, 2020.

A



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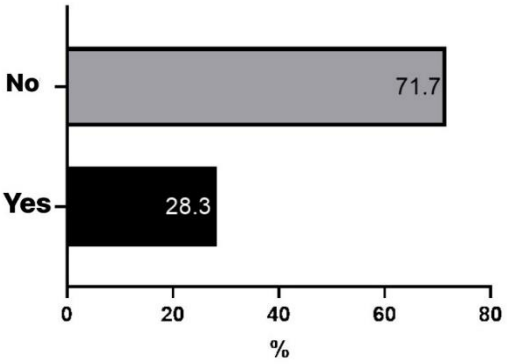

Source: The authors

The prevalence of use of medication to assist in the study, in general, was 28.3% (n=92) (Chart 4B). 69.84% (n=227) of the students reported that they had already used some central nervous system stimulant listed in the questionnaire, such as anxiolytic, antidepressant, hypnotic, Ginkgo biloba, Ritalin (methylphenidate), energy drink, and caffeine, as described in the chart (Chart 5).

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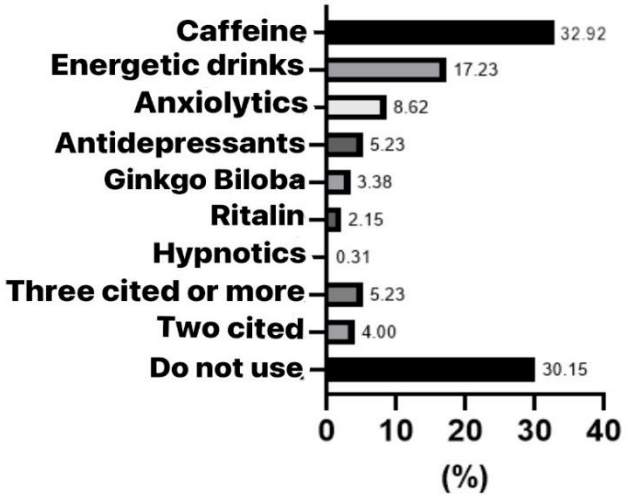
Chart 5 - Description of the use of psychostimulant substances by health students interviewed at the Sertão Integration Faculty, Serra Talhada, 2020

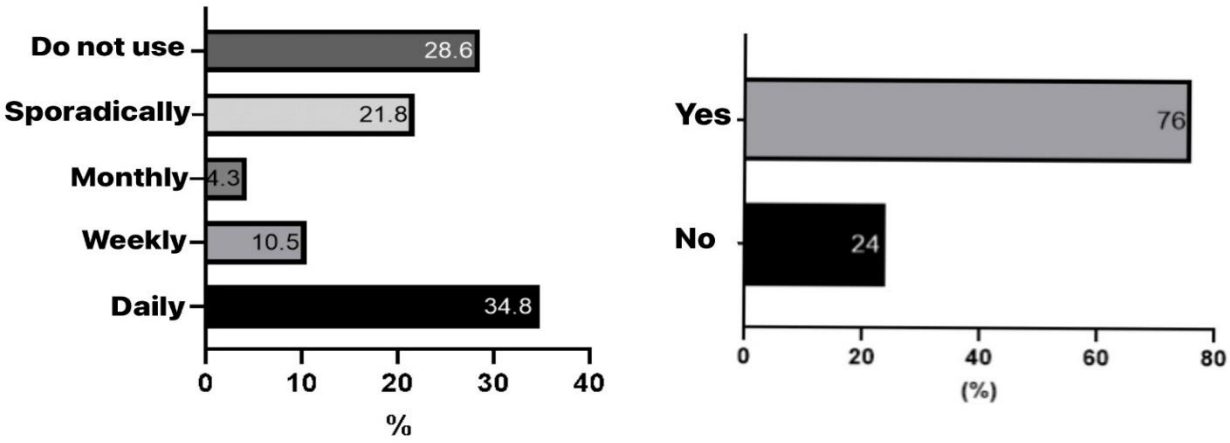


Source: The authors

Regarding the frequency of use of stimulants, 34.8% (n=113) answered that they use it daily, 21.8% (n=71) sporadically (Chart 6A). A higher percentage of use of energy drinks to assist in the study was found, 76% (n=247), such as açaí (acai berry), coffee, energy drinks, or soft drinks, for example (Chart 6B).

Chart 6 - Frequency of brain stimulant use (A) and use of brain stimulant energy drink (B) by respondents from the Sertão Integration College, Serra Talhada, 2020.

A **B**



Source: The authors

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Caffeine is the most used psychoactive drug worldwide, configuring the main component of energy drinks widely consumed by young Brazilian students [13]. A study with 116 university students showed that caffeine is the most frequent psychostimulant used by students, representing 55.66% of use among these students, and within this group, 95.45% do not have a prescription to acquire and use any type of brain stimulant. It was also pointed out that coffee, mate tea, guarana, thermogenic stimulants, and cola-based soft drinks are some types of substances most used by university students [14].

In a survey of students from Biomedicine, Nursing, Pharmacy and Nutrition courses at a private college in the Federal District, 19.5% of a total of 400 respondents (78 respondents) stated that they had already used some medication to help with their study routine, such as guarana powder, being the most cited substance (49%), followed by Ginkgo biloba (35%). Of the total respondents, 6.0% reported using methylphenidate, and among these, only 16.7% had a medical diagnosis of ADHD [15].

The results of the study showed that, among students who declared that they had already used or are using some CNS stimulant, methylphenidate represents 2.15% (n=7) of the responses (Chart 5). Another study carried out with students at the Federal University of Minas Gerais states that the consumption of methylphenidate, regardless of the time of life, was reported by 37 students (37/378; 9.8%). Among these, 22 (22/37; 59%) declared to have used it for neuroenhancement (22/378; 5.8%). The prevalence of recent use of methylphenidate for neuroenhancement was estimated to be 2.4% (9/378) [4].

Regarding the areas of knowledge, students of mathematical sciences and humanities formed a group more likely to use methylphenidate for neuroenhancement, regardless of the time of life. On the other hand, a quantitative observational cross-sectional study carried out with 200 undergraduate medical students showed that the prevalence of stimulant substances consumption was 57.5%, and 51.3% of these began to use them during college. The use of psychostimulants at the time of the survey had a prevalence of 52.3%. It is also noteworthy that 16.6% of students consumed more than one psychostimulant substance [1].

The most consumed substances were energy drinks (38.0%) and caffeine more than five times a week (27.0%). The main reasons given for the consumption of stimulants were to compensate for sleep deprivation (47.4%) and to improve reasoning, attention, and/or memory (31.6%). In a descriptive and exploratory quantitative research carried out with 44 nursing students from the Higher Education Center of Valença, located in the municipality of Valença - state of Rio de Janeiro, 2.3% (n=1) of the interviewees said they used tranquilizers and anxiolytics daily, 4.5% (n =2) less than once a week, 2.3% (n=1) 2 or 3 times a week and 11.4% (n=5) used the questionnaire in the last 3 months. Amphetamine was used in the last 3 months by 2.3% (n=1), daily antidepressants by 4.5% (n=2) and in the last 3 months 4.5% (n=2) used it [6].

Among the main benefits, the reason most mentioned by research participants for the consumption of brain stimulants was decreased sleep, (55%, n=180) (Chart 7A). Regarding post-use symptoms, respondents reported headache (23.08%, n=75), fatigue (16.31%, n=53), indisposition (12%, n=39), amnesia (2 .15%, n=7), high blood pressure (3.38%, n=11), sweating (6.46%, n=21), tachycardia (10.46%, n=34). 4% (n=13) had two symptoms mentioned and 6.46% (n=21)

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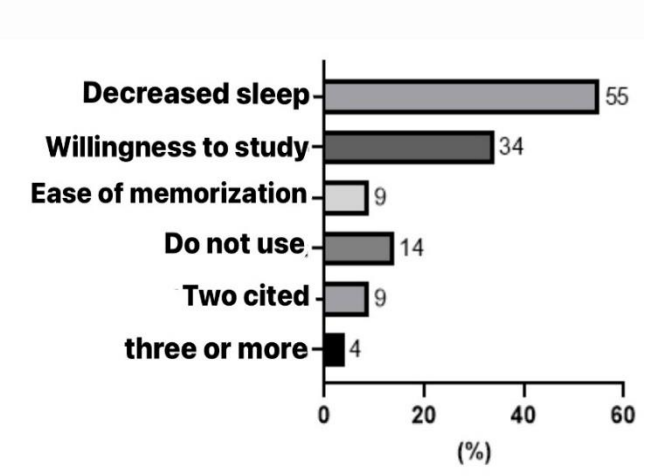
responded that they had three or more symptoms (Chart 7B).

Most clinical manifestations resulting from the use of amphetamines, for example, are due to prolonged adrenergic stimulation, mainly in the CNS and cardiovascular. These range from manifestations of agitation, sweating, mydriasis, nausea, abdominal pain, hypertension, tachycardia, and headache, to more severe manifestations resulting from the use of high doses, such as severe hyperthermia (> 40°C), dehydration, arrhythmias, severe hypertension, acute myocardial infarction, vasospasms, stroke, sudden death, pneumothorax, psychosis, convulsion, ischemic colitis, rhabdomyolysis, liver failure, delusions, paranoia, among others [16].

Chart 7- Benefits of the use of brain stimulants (A) and symptoms after the use of brain stimulants (B) presented by respondents from the Sertão Integration College, Serra Talhada, 2020.

A



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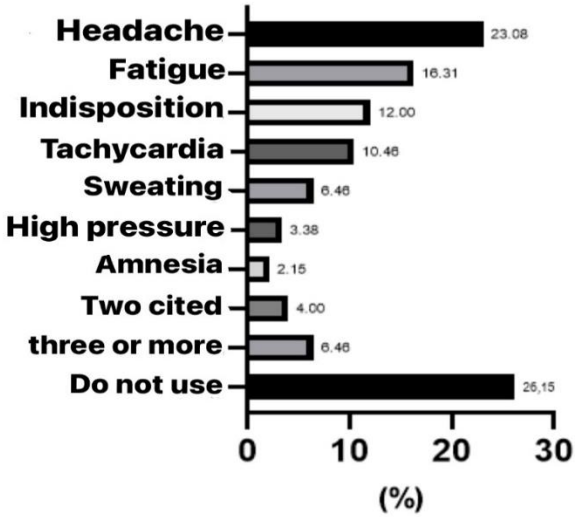

Source: The authors

No CNS stimulant substance is safe when used irrationally and unsupervised, as it can harm the user and, above all, can cause dependence. The growing search for pharmacological cognitive improvement (PCI) has become a worrying aspect, since there is common, sometimes even abusive and uncontrolled consumption by the population [17]. Adverse drug events are defined as injuries resulting from the use of medications. This term has a variety of definitions, including harm caused by drugs in a usual dosage or an unusual dosage, as well as the harm resulting from dose reduction and discontinuation of drug therapy [18].

In the long term, brain stimulants can generate dependence, which leads to both physical and psychological suffering, and sometimes disrupts people's daily activities, leading to difficulty in concentration and anxiety. Dependence can have characteristics such as tolerance, abstinence, and lack of interest in important activities due to substance use. Tolerance to a drug is what occurs after repeated and excessive exposures between the drug and the body, that is, there is a decrease in the drug's effect, requiring higher doses of the substance so that the body responds in the same way and intensity [17].

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CONCLUSION

Psychostimulants, although they promote concentration, disposition, attention, and energy, also end up modifying the mood and wakefulness of users, to raise blood pressure, change heart rate, among other harmful effects on mental health. Thus, it is possible to state that the objectives of this work were achieved. The excessive and irrational use of psychotropic drugs in the academic environment is growing and promoting rationality is a complex task, as it relates to social, economic, educational, and clinical aspects. Investigations must continue to be developed to enable the optimal dimensioning of the problem so that the prevention of damage with dependence, episodes of insomnia and psychosis, deficits in attention, and cognition can be revealed.

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Submission: 2021-04-30
Approval: 2021-07-28