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Risk factors for Central Nervous System drug use among nursing students

Fatores de risco para uso de fármacos do Sistema Nervoso Central entre estudantes de enfermagem

Factores de riesgo para el uso de fármacos del Sistema Nervioso Central en estudiantes de enfermería

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ABSTRACT

Objectives: to verify sociodemographic, academic and health risk factors for Central Nervous System drug use among nursing students. **Methods:** a cross-sectional study with 199 public undergraduate students from Ceará, using Characterization Instrument, Antonovsky's Sense of Coherence Questionnaire, Beck Depression Inventory and Beck Anxiety Inventory. Fischer's exact test and Pearson's chi-square test were performed, verifying an association between variables. Prevalence ratio was used. **Results:** a total of 34 used such drugs, with predominance of use of anxiolytics, associated with age (p=0.026), dissatisfaction with the relationship between classmates (p=0.003), insomnia (p=0.009), chronic disease (p=0.001), depression (p=0.035), and severe anxiety (p=0.023). **Conclusions:** using Central Nervous System drugs among students was associated with sociodemographic, academic and health factors, evidencing the need for actions promoting undergraduate students' mental health.
Descriptors: Central Nervous System Agents; Risk Factors; Students, Nursing; Mental Health; Nursing.

RESUMO

Objetivos: verificar fatores de risco sociodemográficos, acadêmicos e de saúde para o uso de fármacos do Sistema Nervoso Central entre estudantes de enfermagem. **Métodos:** estudo transversal, com 199 estudantes de universidade pública do Ceará, utilizando Instrumento de Caracterização, Questionário de Senso de Coerência de Antonovsky, Inventário de Depressão de Beck e o Inventário de Ansiedade de Beck. Realizou-se Teste exato de Fischer e Teste Qui-Quadrado de Pearson, verificando associação entre variáveis. Utilizou-se Razão de Prevalência. **Resultados:** 34 utilizavam tais fármacos, predominando o uso dos ansiolíticos, associado à idade (p=0,026), à insatisfação com o relacionamento entre colegas de curso (p=0,003), à insônia (p=0,009), à doença crônica (p=0,001), à depressão (p=0,035) e à ansiedade grave (p=0,023). **Conclusões:** o uso de fármacos do Sistema Nervoso Central entre os estudantes esteve associado a fatores sociodemográficos, acadêmicos e de saúde, evidenciando a necessidade de ações promotoras da saúde mental dos universitários.
Descritores: Fármacos do Sistema Nervoso Central; Fatores de Risco; Estudantes de Enfermagem; Saúde Mental; Enfermagem.

RESUMEN

Objetivos: verificar los factores de riesgo sociodemográficos, académicos y de salud por el uso de drogas en el Sistema Nervioso Central en estudiantes de enfermería. **Métodos:** estudio transversal, con 199 estudiantes de una universidad pública de Ceará, utilizando el Instrumento de Caracterización, Cuestionario de Sentido de Coherencia de Antonovsky, Inventario de depresión de Beck y Inventario de ansiedad de Beck. Se realizó la prueba exacta de Fischer y la prueba de chi-cuadrado de Pearson, verificando la asociación entre variables. Se utilizó la razón de prevalencia. **Resultados:** 34 utilizaron este tipo de fármacos, predominantemente ansiolíticos, asociados a la edad (p=0,026), insatisfacción con la relación entre compañeros de curso (p=0,003), insomnio (p=0,009), enfermedad crónica (p=0,001), depresión (p=0,035) y ansiedad severa (p=0,023). **Conclusiones:** el uso de drogas del Sistema Nervioso Central en estudiantes se asoció con factores sociodemográficos, académicos y de salud, destacando la necesidad de acciones para promover la salud mental de los estudiantes universitarios.
Descriptores: Fármacos del Sistema Nervioso Central; Factores de Riesgo; Estudiantes de Enfermería; Salud Mental; Enfermería.

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INTRODUCTION

Drugs that act on the Central Nervous System (CNS) interfere in neurotransmission, either in presynapse, blockade or activation of post-synaptic receptors. This category includes anxiolytic, hypnotic, antidepressant, antipsychotic, antiepileptic, anesthetic, opioid, abuse drugs and CNS stimulants, such as amphetamines[1].

In 2018, 31 million people worldwide suffered some disorder from the use of these substances, with opioids being the class with the highest level of injuries and mortality due to abuse[2]. Population-based study data in Brazil showed that, in 2015, the drug classes of psychotropic drugs most consumed in the country in a non-prescribed or different way from the prescribed form were benzodiazepines (3.9%), followed by opiates (2.9%) and amphetamines (1.4%)[3]. The risk of onset of abuse of these drugs is more pronounced during adolescence, between 12 and 17 years, and may reach the peak of the problem between 18 and 25 years[2].

It is a fact that in Brazil, these drugs are marketed only with medical indication and controlled prescription. However, it is noted that many people make use of them without proper medical prescription. Studies conducted with Brazilian undergraduate students clarify that the drugs most used by them are anxiolytics, barbiturates and amphetamines, and the acquisition of such drugs is mostly through friends or family members who use these drugs[4], and health students perform the use without medical prescription with greater frequency[5].

Regarding the motivations for the improper use of these psychoactive drugs by students, insatisations related to social interaction, the overload of curricular and extracurricular activities or the lack of maturity of the academic in managing his time and establishing priorities[6]. Moreover, the effects of these drugs considered positive, such as improvement in concentration and memory, in addition to the reduction of fatigue and stress, may represent students a quick solution to these common problems in the academic routine[7].

Among the consequences of the use of drugs that work in the CNS reported by undergraduate students in previous studies, there is the reduction of sleep[7] and headache[8] as important side effects. Moreover, the use of some CNS drugs can trigger dependence and tolerance in the body of consumers, who feel the need, over time, for higher doses to promote therapeutic effect[1]. Furthermore, a study demonstrates that the use of stimulants without a prescription may be related to the onset or increase in consumption of other substances, such as alcohol and marijuana[9]. It is noted that, although the side effects of these drugs are known by the people who use them, their consumption is persistent[10].

Thus, studies on sociodemographic, academic and health factors associated with the consumption of drugs that work in the CNS are important, in order to understand the pattern of use of these drugs and, based on modifiable conditions, to institute educational actions on the safe use of such drugs and access to mental health care services in the academic environment.

OBJECTIVES

To verify sociodemographic, academic and health risk factors for CNS drug use among nursing students.

METHODS

Ethical aspects

This study was approved by the Research Ethics Committee of the *Universidade Federal do Ceará*, via *Plataforma Brasil*. Following the research standards with human beings established by Resolution 466/12[11], all research participants signed the Informed Consent Form (ICF).

Study design, period and location

This is a cross-sectional analytical study, conducted through the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) tool[12]. Data were collected from June to September 2019 at a public university located in Fortaleza, Ceará.

Population and sample; inclusion and exclusion criteria

The study population was composed of nursing students with regular enrollment. The sample was probabilistic, simple random and stratified by semester. Sample calculation was performed for finite population, considering a confidence level of 95%, margin of error of 5% and prevalence of 50%, which resulted in a minimum sample of 194 students, which was increased by 2.5% for eventual losses, totaling 199. Students regularly enrolled in any nursing course of the university under analysis and over 18 years of age were included. Students on leave were excluded.

Study protocol

For research data collection, the following were used: Sociodemographic and Academic Characterization Instrument, Antonovsky's Sense of Coherence Questionnaire (ASCQ), Beck Depression Inventory (BDI), and Beck Anxiety Inventory (BAI).

The Sociodemographic and Academic Characterization Instrument was elaborated and tested by the researchers themselves prior to collection. It is divided into chunks, with alternatives corresponding to sociodemographic conditions, aspects related to the university, leisure activities, comfort and well-being, academic and extracurricular activities, as well as life habits.

The ASCQ allows the analysis of how the surveyed face stressors maintaining health, i.e., the ability to use social, physical and individual devices to adapt to everyday problems without falling ill. The Sense of Coherence (SOC) has as components the understanding, management and meaning. The questionnaire is validated with Cronbach's alpha of 0.79 and the answers vary on a scale from 1 to 7[13]. The results of the instrument follow the rule that the higher the value obtained, the higher the SOC.

The BAI was used to measure participants' anxiety level. The questionnaire is validated with Cronbach's alpha between 0.83 and 0.92[14]. This has 21 items related to anxiety symptoms, which should be answered by the students regarding the frequency and severity in the current week, with an interval of 0 to 3 points.

The Beck Depression Inventory II (BDI-II) is validated with Cronbach's alpha of 0.89[14], has 21 items, the statements of which vary on a scale from 0 to 3 points. Students must respond according to last week's self-assessment, so that they rate the level of depression.

Students from the first to the tenth semester of the nursing course at the university in question were drawn to participate in data collection. The questionnaires were delivered, in the classroom, to the students randomly selected in the draw. In the case of students in boarding school, the ICF and the questionnaires mentioned above were sent via e-mail.

Analysis of results, and statistics

The IBM® SPSS® Statistics, version 20.0 was used in the analysis. Age, ethnicity, sexual orientation, religion, income, semester, disapproval, paid academic activity, complementary academic activity, relationship with colleagues, technologies that facilitate the study, enough time to study, chronic disease, health insurance, physical activity, insomnia, depression, anxiety, SOC, use of licit and illicit drugs were predictor variables.

The outcome variable was self-reported use of drugs that act in the CNS. Fischer's exact test and Pearson's chi-square test were performed to verify an association between dependent and independent variables, considering $p < 0.05$ as significant, in a 95% confidence interval. The Prevalence Ratio was also used.

Binary logistic regression was used by enter method with all variables whose p was less than or equal to 0.2, equivalent to 11 variables. The Omnibus test resulted in 0.002, which indicates that the model was significant. To verify the adequacy of the regression models, the Hosmer-Lemeshow test was used, whose value was 0.851, indicating that the model can adequately explain the dependent variable. The prediction was 83.6%. The adjusted regression (R^2) showed a value of 0.260, which reveals that this model explains 26% of the outcome variability.

RESULTS

The study included 199 nursing students, 165 female and 34 male, with a median of 21 years of age and mean family income of about US$614.20. All semesters were contemplated, ranging from 14 to 24 students per class.

Regarding the classes of CNS drugs, all had use by at least one academic, 8 (4.02%) students used drugs of more than one class, with predominance of the use of anxiolytics, 17 (8.54%) students, followed by opioids, with use by 12 (6.03%).

Table 1 presents participants' sociodemographic data associated with the use of drugs that act on the CNS.

It is observed that the variables did not influence the results significantly. Regarding the income variable, the minimum wage in the study period was equal to US$181.45. Table 2 finds the academic variables in association with the use of drugs that work in the CNS.

It was identified that the relationship with the classmates presented a significant value of p= 0.018, with PR= 2.59 (CI= 1.37 - 4.93). This allows us to interpret that, among students with unsatisfactory relationship with their classmates, there is a 2.59 times higher prevalence of drug use that works in the CNS when compared to those with satisfactory relationships.

Table 3 shows the association of variables related to the health of students with the use of drugs that act on the CNS.

Among the variables presented, a significant p-value is identified in the following: chronic disease carrier, with PR= 3.20 (CI= 1.78 - 5.73); insomnia, with PR= 2.57 (CI= 1.39 - 4.77); severe anxiety, with PR=2.45 (CI= 1.05 - 5.72); moderate and severe depression, with PR= 2.70 (CI= 1.33 - 5.48); less SOC, with PR= 2.81 (CI= 1.38 - 5.70).

Regarding the chronic disease diagnosed, 29 (14.6%) students had one or more comorbidities, with prevalence of respiratory diseases, such as asthma (8; 27.6%) and sinusitis (6; 20.7%), and in smaller numbers, mental disorders such as anxiety (1; 3.4%) and depression (3; 10.3%), in addition to pathologies of another nature, such as rheumatoid arthritis (1; 3.4%) and endometriosis (1; 3.4%).

It should be noted that, despite the scale used to contemplate the levels of minimal and mild anxiety, no participant presented these levels mentioned.

Table 4 contains associations that demonstrated significance in the binary logistic regression model.

Table 1 – Association of sociodemographic variables with Central Nervous System drug use among interviewed students, Fortaleza, Ceará, Brazil, June to September 2019

Variables	Central Nervous System drug use				PR	95% CI	*p* value
	Yes	%	No	%			
Age							
Up to 21 years	21	61.8	82	49.7	1.51	0.80 - 2.84	0.200**
Over 21 years	13	38.2	83	50.3			
Ethnicity							
White	11	32.4	38	23.0	1.46	0.77 - 2.78	0.251**
Non-white	23	67.6	127	77.0			
Sexual orientation							
Heterosexual	27	79.4	137	83.0	0.82	0.39 - 1.74	0.614**
Non-heterosexual	7	20.6	28	17.0			
Religion							
Yes	25	73.5	142	86.1	0.53	0.27 - 1.03	0.070**
No	9	26.5	23	13.9			
Family income							
Up to about US$363.63	14	45.2	76	52.4	0.79	0.41 - 1.50	0.463**
Above about US$363.63	17	54.8	69	47.6			

**Fischer test; **Pearson's chi-square test; PR – Prevalence ratio; CI – Confidence interval.*

Table 2 – Association of academic variables with Central Nervous System drug use among interviewed students, Fortaleza, Ceará, Brazil, June to September 2019

Variables	Central Nervous System drug use				PR	95% CI	*p* value
	Yes	%	No	%			
Semester							
Until the 5th semester	20	58.8	87	52.7	1.23	0.66 - 2.29	0.516**
From the 6th to the 10th semester	14	41.2	78	47.3			
Failure							
Yes	6	17.6	31	18.8	0.94	0.42 - 2.10	0.876**
No	28	82.4	134	81.2			
Complementary academic activities							
Yes	30	88.2	135	81.8	1.54	0.58 - 4.10	0.365**
No	4	11.8	30	18.2			
Paid academic activity							
Yes	13	38.2	78	47.6	0.73	0.39 - 1.37	0.321**
No	21	61.8	86	52.4			
Relationship with classmates							
Unsatisfactory	9	27.3	16	9.7	2.59	1.37 - 4.93	**0.018***
Satisfactory	24	72.7	149	90.3			
Technologies facilitating the study							
Yes	32	94.1	163	98.8	0.33	0.12 - 0.92	0.136*
No	2	5.9	2	1.2			
Time enough to study							
Yes	5	14.7	48	29.1	0.47	0.19 - 1.16	0.084**
No	29	85.3	117	70.9			

**Fischer test; **Pearson's chi-square test; PR – Prevalence ratio; CI – Confidence interval.*

Table 3 – Association of health variables with Central Nervous System drug use among interviewed students, Fortaleza, Ceará, Brazil, June to September 2019

Variables	Central Nervous System drug use				PR	95% CI	*p* value
	Yes	%	No	%			
Chronic disease carrier							
Yes	12	35.3	17	10.3	3.20	1.78 - 5.73	**0.001***
No	22	64.7	148	89.7			
Health insurance							
Yes	19	55.9	68	42.5	1.56	0.84 - 2.88	0 .154**
No	15	44.1	92	57.5			
Physical activity practice							
Yes	12	35.3	66	40.0	0.85	0.44 - 1.61	0.609**
No	22	64.7	99	60.0			
Insomnia							
Yes	20	58.8	50	30.9	2.57	1.39 - 4.77	**0.002****
No	14	41.2	112	69.1			
Anxiety level							
Severe	24	80.0	95	58.6	2.45	1.05 - 5.72	**0.027****
Moderate	6	20.0	67	41.4			
Depression level							
Moderate and severe	25	73.5	76	46.1	2.70	1.33 - 5.48	**0.004****
Minimal and mild	9	26.5	89	53.9			
Sense of Coherence							
Smaller SOC	25	73.5	74	44.8	2.81	1.38 - 5.70	**0.002****
Greater SOC	9	26.5	91	55.2			
Use of licit drugs							
Yes	18	52.9	81	49.1	1.14	0.61 - 2.10	0.683**
No	16	47.1	84	50.9			
Use of illicit drugs							
Yes	3	8.8	21	12.7	0.71	0.23 - 2.13	0.524*
No	31	91.2	144	87.3			

**Fischer test; **Pearson's chi-square test; PR – Prevalence ratio; CI – Confidence interval.*

According to Table 4, students up to 21 years of age and those who are dissatisfied with the relationship with their classmates are 15.17 and 627.52 times, respectively, more likely to use such drugs. On the other hand, students who have insomnia and those with chronic disease have an increased chances of 53.73 and 640.52 times, respectively, for the use of CNS drugs. Moreover, students with moderate and severe depression and those with severe anxiety are 28.75 and 35.89 times more likely to use these drugs, respectively.

Table 4 - Binary logistic regression model of Central Nervous System drug use among interviewed students, Fortaleza, Ceará, Brazil, June to September 2019

Variables	OR**	95%CI**	*p* value
Age			
Up to 21 years	15.17	1.37 - 167.41	0.026
Over 21 years			
Relationship with classmates			
Unsatisfactory	627.52	8.90 - 44202.61	0.003
Satisfactory			
Insomnia			
Yes	53.73	2.71 - 1063.65	0.009
No			
Chronic disease carrier			
Yes	640.52	12.78 - 32103.54	**0.001**
No			
Depression level			
Moderate and severe	28.74	1.26 - 655.94	0.035
Minimal and mild			
Anxiety level			
Severe	35.89	1.65 - 780.17	0.023
Moderate			

***OR – Odds Ratio; **CI – Confidence Interval.*

DISCUSSION

Regarding the profile of students who use drugs in the CNS, a higher prevalence was observed among those up to 21 years of age. In contrast, a French study with undergraduate students in the Pharmacy course reveals that students using psychotropic drugs were significantly older than non-users and users of illicit drugs[15].

Regarding ethnic perspectives, no significant association was found between self-declared race and drug use. However, a study that investigated the existence of racial inequality in the use of psychotropic drugs among adolescents, older adults and adults observed a higher prevalence of use among white people. This could be explained by the lower demand for and access to health services by black and brown people, preventing use by medical prescription, as well as lower frequency of autonomy for the perception of mental health problems among black people[16]. Thus, it is emphasized that the non-use of these drugs does not constitute a health defining factor, since they may be necessary, but not be included due to the lack of diagnosis of affected health conditions. In the present study, the highest frequency of use of these drugs occurred among non-whites, which may be associated with the difference in the studied scenarios, modifying the socioeconomic conditions of the sample and participants' level of health knowledge.

It is known that attachment bonds and effective interpersonal communication influence the proper psychological functioning, as this helps in coping with stressful events in life that often precede depression[17]. Therefore, having a satisfying relationship with classmates, people with whom one has lived for long periods, becomes a protective factor for the development of mental disorders and, consequently, in the use of drugs for its treatment, as it contributes to a healthier course of academic life.

Regarding insomnia, the prevalence in this study was 35.1% and, among these, 28.6% used the drugs analyzed. In comparison, a systematic review reveals that the prevalence of insomnia among undergraduate students in the South Asian region was 52.1%[18]. Also, a Colombian research conducted with medical students reveals that sleep problems are the most frequent predictor mental symptom for the practice of self-medication, and 78.6% say they would continue with self-medication, even aware of the risks[19]. In view of this, it is suggested the strengthening of other treatment modalities for insomnia, such as Integrative Health Practices, in order to reduce side effects and counter the still predominant biomedical model.

Furthermore, in the analysis of the health conditions of the sample, a higher prevalence of chronic non-psychiatric diseases was found, more specifically, respiratory diseases. Yet, among patients with chronic diseases, there were increased chances for CNS drug use. In this sense, in a North American study, patients with three or more non-psychiatric chronic diseases were 1.12 times more likely to use off-label psychotropic drugs[20], i.e., the therapeutic indication of the use of this drug is different from that approved in a package leaflet[21]. This may be a consequence of the failure of previous therapies, which leads to a higher chance that one or more treatment options are an off-label prescription[20]. Moreover, the bidirectional association between chronic diseases and psychopathological factors may exacerbate both conditions[22], increasing the use of CNS drugs among patients with chronic pathologies.

Of the students who reported the use of CNS drugs, 80% had a severe anxiety level. Likewise, French research reveals that students who used psychotropic drugs reported higher levels of anxiety and depression and self-medication users had higher levels of these symptoms[15]. Regarding depression, among those who did not use the medications, the minimum/mild depression exceeded by 7.8% to moderate/severe.

SOC is the ability to understand, manage and give meaning to daily issues, allowing coping with daily stressors[13]. In this study, students who had lower SOC had a 2.81 times higher prevalence of drug use that works in the CNS. A study with Norwegian patients with psychotic disorders showed a statistically significant association between basic self-disorders and CS, because the presence and level of self-disorders may interfere with individuals' ability to manage life and to signify it[23]. Thus, the use of drugs from the CNS is a means of alleviated self-disturbances, with the purpose of reinvigorating resilience in coping with problems.

Study limitations

The study presented limitations regarding its representativeness, because the sample consisted of students from a single undergraduate course. Also, there was no question about medical prescription or not. Still, no questions were asked about non-pharmacological therapies, which may influence variables such as anxiety and depression. It is also worth mentioning that because it covers more than one predictor variable, there is the possibility of covariance.

Contributions to nursing

Due to increased cases of mental disorders in undergraduate students and negative outcomes subsequent to this, studies that allow the understanding of the pattern of the use of drugs that are part of treatment facilitate targeting health promoting actions in the academic environment.

CONCLUSIONS

It is concluded that the use of drugs that act on the CNS among nursing students was associated with age, dissatisfaction with relationships with classmates, insomnia, chronic disease, depression and anxiety at higher levels.

Research data reveal the need for interventions in promoting mental health of undergraduate students, considering the presence of modifiable risk factors. Moreover, it is emphasized the importance of reducing use-related har, so that professionals in training have a better quality of life and, thus, can promote more qualified care for patients.

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