Article

Cássia Regina Primila Cardoso Berti[1,*]
Alice Milani Nespollo[1]
Moises Kogien[2]
Evelyn Kelly das Neves Abreu[2]
Samira Reschetti Marcon[2]
Tatiane Lebre Dias[3]

Variables Associated with the Use of Psychotropic Medications by Brazilian University Students

[1]Institute of Health Sciences, Federal University of Mato Grosso State, 78550-728 Sinop, Mato Grosso, Brazil
[2]Faculty of Nursing, Federal University of Mato Grosso State, 78060-900 Cuiabá, Mato Grosso, Brazil
[3]Institute of Education, Federal University of Mato Grosso State, 78060-900 Cuiabá, Mato Grosso, Brazil

Abstract

Background: University life is a phase of developing personal and professional skills, but it brings challenges such as distancing from family and supporting networks, difficulties with academic tasks, loneliness, new relationships, competitiveness, and social, socioeconomic, and psychological vulnerability, among others. These conditions can lead to the development of illnesses such as anxiety, depression, sleeping disorders, suicide, self-harming, and excessive drug use, including psychotropic medications. Therefore, this study aimed to evaluate the use of psychotropic medications and its association with sociodemographic, academic, behavioral, and health variables in Brazilian university students.

Methods: A cross-sectional, quantitative research, with a sampling of 524 students from a Brazilian public Higher Education Institution (Federal University of Mato Grosso - UFMT). The collection took place from October 10th to December 30th, 2022. An online questionnaire was applied with sociodemographic and clinical questions—the General Anxiety Disorder Questionnaire-7 (GAD-7) and the Patient Health Questionnaire-9 (PHQ-9). The data were descriptively and inferentially analyzed; in the descriptive analysis, the absolute (FA) and relative (FR) frequencies of each category investigated were presented; and for bi- and multivariate analyses, Poisson regression with robust estimation was used.

Results: The participants were at the median age of 22 years old, the majority were female (69.7%), heterosexual (68.1%), with medium/high subjective social status (82.4%) and without being involved in a romantic relationship (54%). The prevalence of psychotropic medication use was 26.1%, considering that 17.5% was not prescribed by a medical professional. The most used class of medications was antidepressants (91 participants), followed by natural medicines (38 participants). Among the segments associated with the use of psychotropic drugs were female individuals, romantic relationships, perception of academic performance by postgraduate students, and previous diagnoses of mental or mood disorders (depression and anxiety).

Conclusions: The results obtained highlight the importance of research on mental health among university students, especially regarding the use of psychotropic drugs, which must be monitored by a qualified professional. At the university, these data can be important for the development of policies aimed at health and life quality, in addition to contributing to the strengthening of national and international partnerships, and promoting the scientific production in the area.

Keywords

mental health; universities; psychotropic drugs; depression; anxiety

Introduction

A student's admission at a higher education institution means the start of a new phase of his/her life, related to professional and personal development [1]. The transformations which accompany the development of an autonomous personal life, added to the demands of academic life and expectations regarding to professional future, can affect the psychological well-being of students [2].

*Corresponding author details: Cássia Regina Primila Cardoso Berti, Institute of Health Sciences, Federal University of Mato Grosso State, 78550-728 Sinop, Mato Grosso, Brazil. Email: cassia.cardoso@ufmt.br

From this perspective, research corroborates that these conditions can lead to the development of diseases such as anxiety, depression, sleep disorders, excessive consumption of legal or illicit drugs, and suicide attempts which even lead to accomplished suicide [3,4].

Some risk factors enhance a university student's dysfunctional psychosocial process, including distance from family, living in loneliness, precarious interpersonal relationships, hierarchy of knowledge verticalization, adaptation to a new city and to academic life, competitiveness, individualism, social and psychological vulnerability, contemporary pressures to continue studying, anxiety about the future entry into the job market, among others. Therefore, these factors promote an ontological insecurity which can make suffering unbearable [5].

When researching university students at a public university in the interior of São Paulo state (Brazil), it was found the presence of explicit indicators of malaise and compromised quality of life. 119 students were investigated, of which 107 responded they experienced psychological distress, indicating the need for actions and strategies from university managers [6]. In line with these results, a recent investigation pointed out the prevalence of psychological distress in 545 students at a private university in Ceará state (Brazil), leading to the conclusion that variables such as sex, alcohol, and medication consumption, in addition the fact of being at the end of the course, are associated with severe levels of anxiety, predisposing to greater psychological distress [7].

Depression and anxiety are present symptoms in university life, as shown in a study carried out among 636 undergraduate students at a public university in Mato Grosso state (Brazil), in which 42% presented depressive symptoms [8]. This also happens to postgraduate students, who showed a prevalence of 52.03% depression and 54.33% anxiety, in a sample of 565 participants from a public university in the same state [9]. According to the previously shown, such evidences indicate that university students, facing the psychological suffering caused by the academic experience, are vulnerable to consumption of psychotropic drugs, whether prescribed by a qualified professional or through self-medication, from the perspective of treating diagnosed disorders and the symptoms present.

This fact is corroborated by a study carried out among dentistry and medicine university students in Maceió, Alagoas state (Brazil), where 55.2% of participants stated that they had obtained psychotropic drugs through medical prescription, 21.5% through friends and family and 12.9% without a medical prescription. However, the practice of self-medication can produce several adverse effects, such as chemical and physical dependence and psychological and/or somatic disorders, resulting in problems for the individual's health. Furthermore, in some conditions, medications, when taken in conjunction with alcohol, can induce drug interactions, involving the risk of death [10].

Authors describe the variables such as female gender, being in a stable romantic relationship [11] and academics from health area [12,13] are strongly associated to the use of psychotropic drugs, among university students. Furthermore, the main therapeutic class used by the target audience is antidepressants, such as Selective Serotonin Reuptake Inhibitors (SSRIs) [11,14]. In addition to the use of psychotropic drugs, there is a prevalence of other psychoactive substances, such as alcohol, and tobacco, among others, offering the risk of abuse in social and academic moments [15]. The consumption of some substances during academic activities involves health risk factors, including changes in consciousness, risk of dependence, pharmacological interactions, potential adverse effects from drugs, and psychological distress, especially alcohol intake abuse, concomitant with the use of other substances [16].

Taking into consideration this information, it is evident the need for projects and action strategies, which aim to identify psychological suffering and general aspects of the mental health of university students, through validated scientific instruments, in addition to preventing suffering, whether caused by previous remarkable social experiences, or through students' academic experiences, facing an immense, complex, and unknown world. In addition to the psychological issues, it is important to know the dysfunctional habits, especially the incorrect use of psychotropic medications, as well as the possible associated variables, favoring intervention strategies in students' life quality, according to the needs of the studied population.

Therefore, the main objective of this study was to evaluate the association between sociodemographic and clinical variables with the use of psychotropic medications by Brazilian university students. The secondary objectives were: (1) to describe the frequency of use of psychotropic medications and their pharmacological classes; (2) to determine the associations between the use of psychotropic medications and sociodemographic variables; (3) to determine the association between academic and clinical characteristics and the use of psychotropic medications.

Materials and Methods

This is a cross-sectional observational study, with a quantitative approach, carried out at a public higher education institution located in Brazil's central region. The study was carried out from October to December 2022.

Participants

The population was composed of university students from undergraduate and postgraduate courses, at the campuses of a public Brazilian High Education Institution. According to institutional data, in 2019, 10,541 students were enrolled in high education courses and 2449 in *strictu sensu* postgraduate courses. The sampling is in an intentional non-probabilistic way, defined only by the students' availability and acceptance to participate in the research.

The inclusion criteria:

All students who completed the questionnaire met the following criteria:

a. Were eligible undergraduate and postgraduate students who carried a smartphone at the time of data collection;

b. Who was aged 18 or over at the time of data collection;

c. Who was regularly enrolled at the Federal University of Mato Grosso - UFMT campuses in 2022.

The exclusion criteria:

Regarding exclusions, the forms completed by students from other High Education Institutions (HEIs) were disregarded, as the Quick Response (QR) Code was shared among participants and accessed to the project's means of dissemination. Twenty-three forms were excluded as they were completed by students from other universities, which was the only exclusion criterion. Additionally, 2 participants accepted the consent form but did not complete the questionnaire. Therefore, the total number of participants was 549 university students, resulting in a final sample of n = 524 valid questionnaires.

Instruments

The online form was composed of closed questions, prepared by the authors (sociodemographic and clinical questions), which were prepared based on the General Anxiety Disorder Questionnaire-7 (GAD-7) elaborated by Spitzer *et al.* in 2006 [17] and validated in Brazil by Moreno *et al.* in 2016 [18]; and the Patient Health Questionnaire-9 (PHQ-9), an instrument developed by Kroenke, Spitzer, and Williams in 2001 [19] and translated into Brazilian Portuguese by Fraguas *et al.* in 2006 [20].

The GAD-7 is a brief, unidimensional scale that identifies symptoms of generalized anxiety disorder. It consists of seven items and assesses the frequency which the individual has felt affected by the described symptoms in the past week. It uses a 4-point Likert scale, with response options ranging from 0 ("rarely") to 3 ("nearly every day"). The final score can range from 0 to 21, with higher scores indicating greater severity of perceived anxious symptoms. In the validation study [18], the instrument showed good psychometric properties and was considered valid for assessing generalized anxiety symptoms in Brazilian adults, with satisfactory reliability (α = 0.92). The study of the scale's dimensionality conducted with 545 adults using confirmatory factor analysis, it presented fit indices for the unidimensional model of Root-Mean-Square Error of Approximation (RMSEA) = 0.08; Comparative Fit Index (CFI) = 0.993; Tucker Lewis Index (TLI) = 0.990, Cronbach's alpha and McDonald's omega of 0.92 [21]. A general cut-off points of 10 is used for the scale. The instrument consists of seven items, arranged on a four-point Likert scale (0 = not at all, 1 = several days, 2 = more than half the days, and 3 = nearly every day), with scores ranging from 0 to 21. The questions measure the frequency of anxiety signs and symptoms over the past two weeks, aiming to screen for potential diagnosis of Generalized Anxiety Disorder - GAD. For analysis purposes, symptoms were categorized as either present or absent.

The PHQ-9 is a self-administered, unidimensional scale consisting of 9 items to identify symptoms consistent with a major depressive episode present in the last two weeks. It uses a 4-point Likert scale response format, ranging from 0 ("not at all") to 3 ("nearly every day"), providing an overall score ranging from 0 to 27 points. The higher the score, the greater the severity of depressive symptoms. The instrument's responses range from 0 to 3 based on the number of days the symptom has occurred in the past two weeks. The severity of symptoms is categorized according to the total score: 0–4—none/minimal; 5–9—mild; 10–14—moderate; 15–19—moderately severe; 20–27—severe. For analysis purposes, symptoms were categorized as either present or absent [19]. A study conducted with 3163 Brazilian university students, presented a Cronbach's alpha of 0.89 and fit indices from the exploratory factor analysis for the unidimensional model of RMSEA: 0.054, CFI: 0.994, and TLI: 0.990 [22].

Table 1. Variables researched (outcome and associated).

Outcome variable	Categories	Instrument used
Use of psychotropic drugs	Yes/no	Sociodemographic, behavioral, and clinical questionnaire (researchers)
Classes of psychotropic drugs	Antidepressants Benzodiazepines Mood stabilizers Antipsychotics Psychostimulants Natural products	Sociodemographic, behavioral, and clinical questionnaire (researchers)
Variables for association		
Sociodemographic/economic		Sociodemographic, behavioral, and clinical questionnaire (researchers)
Median age	22 years old	
Gender	Male/female	
Sexual orientation	Heterosexual/minorities	
Subjective social status	Low/medium–high	
Financial support	Yes/no	
Work	Yes/no	
Academics		Sociodemographic, behavioral, and clinical questionnaire (researchers)
Campus	Capital/interior	
Course cycle	Undergraduate/postgraduate	
Concentration area	Agricultural/biological/health /humanities/engineering/letters /exact/Social Sciences	
Performance (subjective)	Insufficient/sufficient	
Behavioral		Sociodemographic, behavioral, and clinical questionnaire (researchers)
Love relationship	Yes/no	
Living together (partner)	Yes/no	
Coffee/energy drink consumption	Yes/no	
Smoking cigarettes	Yes/no	
Consumption of alcoholic	Yes/no	
More than 4/5 doses of alcoholic beverages on the same occasion	Yes/no	
Cannabis consumption	Yes/no	
Consumption of other psychoactives	Yes/no	
Mental health (clinical variables)		
Diagnosis of mental disorder	Yes/no/I prefer not to answer	
Anxious symptoms	Present/absent	Sociodemographic, behavioral, and clinical questionnaire (researchers)
Depressive symptoms	Present/absent	General Anxiety Disorder Questionnaire-7 (GAD-7) Patient Health Questionnaire-9 (PHQ-9)

It addressed aspects considered important for association statistical analysis (such as gender, age, and sexual orientation; economic variables, such as financial support and work; academic variables, such as campus, academic cycle, and subjective performance; mental disorders, depressive and anxiety symptoms). Table 1 presents the variables researched in this study.

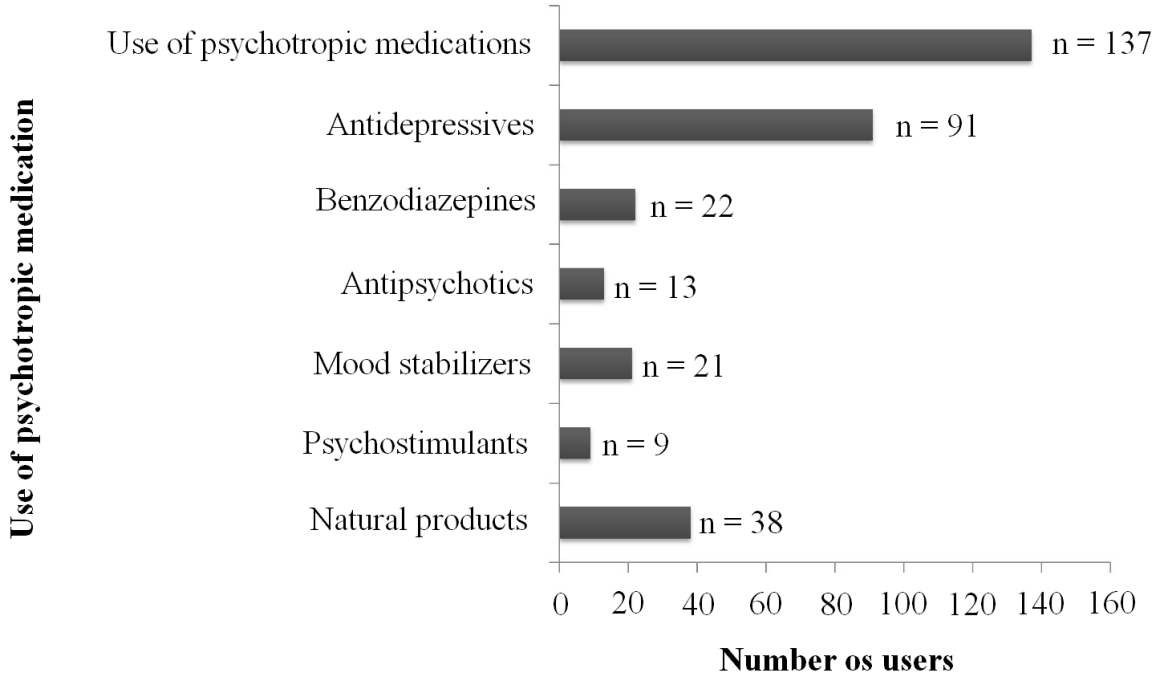

Fig. 1. Frequency of use of psychotropic medications and their pharmacological classes* in a sample of Brazilian university students (137 users out of 524 survey participants). *As it was possible for each student to report the use of more than one medication class, it was decided to discuss this variable only through its absolute frequency.

Data Collection

During the data collection period, the previously trained form applicators, contacted the students through visits to the classrooms on alternate days and periods, according to the timetables of each course and in the common living spaces, such as university restaurants, libraries, and kiosks. During the approach, the applicators briefly presented the research and its objectives to the participants, taking with them banners and printed pamphlets and folders, in addition to the QR code (quick response, in English) to allow direct access to the informed consent form and the online form. The research complied with Resolution 466, of December 12, 2012 (National Health Council/Ministry of Health, Brazil) [23], which regulates research with human beings and was evaluated by the Ethics and Health Research Committee of UFMT in Cuiabá, being approved under opinion 5,655,248. Students had free choice to sign the informed consent form (online) and, after acceptance, they were directed to the questionnaire, which was prepared and was under the responsibility of Professor Dr. Samira Marcon, which has been applied in all UFMT *campuses*. This article followed the Declaration of Helsinki (1964, last revised in 2013).

To declare their consent, the university students, after reading the term, selected the dialog box corresponding to the option "yes, I accept and agree", declaring their knowledge of the term and their acceptance to participate in the study. Only after expressing consent, the participants had access to the form and were able to participate in the study.

Statistical Analysis

The collected data were analyzed descriptively and inferentially using the IBM® Statistical Package for Social Sciences software, version 27.0 (SPSS Inc., Chicago, IL, USA). In the descriptive analysis it was presented the frequencies absolute (FA) and frequencies relative (FR) of each investigated category; and for bi and multivariate analysis, it was used Poisson regression with robust estimation. For bivariate analysis, it was reported the crude or unadjusted prevalence ratio (cPR), which significance level was estimated using the Wald test. To construct the multiple models, it was tested all explanatory variables which had presented a p value < 0.20 in the bivariate analysis, and these were introduced simultaneously, by using the backward technique [24]. The variables which had presented $p > 0.05$ in the multiple analysis, were removed one by one, until the only variables which presented a value of $p < 0.05$ remained retained in the final model, and presented their

Table 2. Association between sociodemographic characteristics and the use of psychotropic medications in university students (n = 524).

Variable (n)	Use of psychotropic medication		χ^2	cPR*	95% CI	*p*-value
	Yes (%)	No (%)				
Gender						
Female (365)	115 (31.5%)	250 (68.5%)	17.909	2.227	1.502, 3.453	<0.001
Male (159)	22 (13.8%)	137 (86.2%)		1		
Sexual orientation						
Minorities (167)	46 (27.5%)	121 (72.5%)	0.246	1.016	0.953, 1.084	0.620
Heterosexual (357)	91 (27.5%)	266 (74.5%)		1		
Social subjective status						
Low (1 to 3) (92)	25 (27.2%)	67 (72.8%)	0.060	0.990	0.915, 1.071	0.806
Med./high (≥4) (432)	112 (25.9%)	320 (74.1%)		1		
Median age (md = 22)						
≤22 years old (313)	74 (23.6%)	239 (76.4%)	2.522	0.952	0.896, 1.012	0.115
>22 years old (211)	63 (29.9%)	148 (70.1%)		1		
Being in a loving relationship						
Yes, without living together (140)	39 (27.9%)	101 (72.1%)	1.359	1.043	0.972, 1.119	0.244
Yes, living together (101)	34 (33.7%)	67 (66.3%)	4.514	1.090	1.007, 1.180	0.034
No (283)	64 (22.6%)	219 (77.4%)		1		

cPR*, crude prevalence ratio.

adjusted prevalence ratios (aPR) and their respective 95% confidence intervals.

Results

524 students, over the age of 18, which were enrolled during the collection period, participated in the research. The median age of the participants was 22; 94.5% were undergraduate and 5.5% postgraduate students; 68.5% were from the UFMT campuses in the capital and 31.5% in the interior of the state. There was a predominance of female respondents—69.7% (identified at birth) and heterosexuals (68.1%). Regarding the area of concentration of the students' courses, there was observed greater participation in the areas of health (22.13%) and Social and Applied Sciences (20.22%). Regarding the sociodemographic profile, 82.4% of university students have indicated a medium to high subjective social status, with 70.2% receiving financial support and 52.7% working and studying simultaneously. It is also important to highlight that 54.0% have indicated that they were not involved in a romantic relationship. The prevalence of psychotropic medication use in this sample of university students, was 26.1% (n = 137), of which 17.5% (n = 28) were not prescribed by a medical professional (see Fig. 1).

Table 2 shows the bivariate associations between the use of psychotropic medications and sociodemographic variables, showing that the outcome was significant among female students ($p < 0.001$) and among those who live together with a partner in a romantic relationship ($p = 0.034$).

Table 3 presents associations between academic variables and the use of psychotropic medications, considering it was statistically significant for postgraduate students ($p = 0.008$), who assessed their academic performance as insufficient ($p = 0.024$) and for students attending courses in the areas of Engineering ($p = 0.045$) and Linguistics, Literature, and Arts ($p = 0.043$) when compared to those from Applied Social Sciences.

The bivariate associations between clinical characteristics and the use of psychotropic medications are presented in Table 4, which shows that the outcome is significant among students with depressive symptoms ($p = 0.004$), with anxiety symptoms ($p = 0.011$), and with a history of mental disorders diagnosis ($p < 0.001$) or who preferred not to answer this question ($p = 0.006$).

Table 5 presents the multiple regression data and the variables that were associated with the use of psychotropic medications by students. There was an emphasis on females, postgraduate study cycles (even with a smaller number of participants), and students with insufficient subjective assessment of their own performance, in addition to a previous diagnosis of mental disorders.

Table 3. Association between academic characteristics and the use of psychotropic medications in university students (n = 524).

Variable (n)	Use of psychotropic medication		χ^2	cPR*	95% CI	*p*-value
	Yes (%)	No (%)				
Study cycle						
Postgraduate (29)	14 (48.3%)	15 (51.7%)	7.112	1.188	1.047, 1.348	0.008
Graduation (495)	123 (24.8%)	372 (75.2%)		1		
Campus						
Capital (359)	90 (25.1%)	269 (74.9%)	0.671	0.973	0.913, 1.038	0.413
Interior (165)	47 (28.5%)	118 (71.5%)		1		
Subjective assessment of performance						
Insufficient (144)	48 (33.3%)	96 (66.7%)	5.066	1.080	1.010, 1.155	0.024
Sufficient (380)	89 (23.4%)	291 (76.6%)		1		
Financial support						
No (156)	42 (26.9%)	114 (73.1%)	0.069	1.009	0.945, 1.077	0.793
Yes (368)	95 (25.8%)	273 (74.2%)		1		
Are you a student worker?						
Yes (276)	71 (25.7%)	205 (74.3%)	0.053	0.993	0.935, 1.054	0.817
No (248)	66 (26.6%)	182 (73.4%)		1		
Concentration area of the course						
Agricultural sciences (94)	28 (29.8%)	66 (70.2%)	3.078	1.579	0.955, 2.608	0.075
Biological sciences (14)	04 (28.6%)	10 (71.4%)	0.729	1.514	0.605, 3.790	0.375
Health sciences (116)	34 (29.3%)	82 (70.7%)	3.077	1.553	0.956, 2.524	0.075
Human sciences (96)	25 (26.0%)	71 (74.0%)	1.503	1.380	0.821, 2.319	0.224
Engineering (31)	11 (35.5%)	20 (64.5%)	3.902	1.881	1.014, 3.487	0.045
Linguistics, letters and arts (18)	07 (38.9%)	11 (61.1%)	3.910	2.061	1.023, 4.154	0.043
Exact and of land sciences (49)	08 (16.3%)	41 (83.7%)	0.150	0.865	0.410, 1.826	0.704
Applied Social Sciences (106)	20 (18.9%)	86 (81.1%)		1		

cPR*, crude prevalence ratio.

Discussion

The data resulting from this study show a high prevalence of psychotropic medication use among the surveyed university students. Moreover, it is emphasized that the factors associated with the use of these medications included being female, being in a romantic relationship, self-perceived academic performance among graduate students, and a previous diagnosis of mental or mood disorders, including depression and anxiety.

The use of psychotropic drugs by university students was also verified in the study by Arraes *et al.* [25] based on a literature review and Araújo *et al.* [10] when investigating medicine and dentistry students. Self-medication among university students is a worrying issue because, among those who practice it, there are the ones without a permanent employment relationship, with high income (financed by family members), women (with self-image disorders), men (with risky behaviors after drugs use or those who felt extremely pressured by the academic environment) [15,26].

Regarding the use of psychotropic drugs, the most used class of medications was antidepressants, followed by natural medications. These data are in accordance with the literature since antidepressants, especially SSRIs, can be used for pharmacological treatment of symptoms of anxiety and depression and they are the most used by Brazilian university students [27].

Among the sociodemographic variables investigated, an association was found between the use of psychotropic medications and female students and among those who live together with a partner in a romantic relationship. Regarding females, De Souza *et al.* [28] consider that among young adults, women, in general, are more vulnerable to some mental disorders. This occurs due to life cycle experiences, hormonal influences, vulnerability to violence and exploitation in relationships, cultural factors, and gender discrimination. Therefore, due to this vulnerability, females are more likely to use psychotropic medications. This fact may explain the reasons why several studies on university students' mental health indicate the predominance of female participants in research, converging with the findings of this study [29,30].

Table 4. Association between clinical characteristics and the use of psychotropic medications in university students (n = 524).

Variable (n)	Use of psychotropic medication		χ^2	cPR*	95% CI	*p*-value
	Yes (%)	No (%)				
Depressive symptoms (PHQ-9 ≥10)						
With (363)	109 (30.0%)	254 (70.0%)	9.223	1.727	1.191, 2.503	0.004
Without (161)	28 (17.4%)	133 (82.6%)		1		
Anxious symptoms (GAD-7 ≥10)						
With (314)	95 (30.3%)	219 (69.7%)	6.951	1.513	1.100, 2.080	0.011
Without (210)	42 (20.0%)	168 (80.0%)		1		
Diagnosis of mental disorders						
Yes (174)	96 (55.2%)	78 (44.8%)	139.745	5.274	3.735, 7.447	<0.001
Rather not answer (25)	07 (28.0%)	18 (72.0%)	8.756	2.676	1.323, 5.414	0.006
No (325)	34 (10.5%)	291 (89.5%)		1		
Consumption of coffee/energetic drinks						
Yes (461)	118 (25.6%)	343 (74.4%)	0.570	0.849	0.565, 1.275	0.429
No (63)	19 (30.2%)	44 (69.8%)		1		
Smoking cigarettes						
Yes (110)	29 (26.4%)	81 (73.6%)	0.003	1.011	0.711, 1.437	0.953
No (414)	108 (26.1%)	306 (73.9%)		1		
Alcoholic consumption						
Yes (n = 389)	102 (26.2%)	287 (73.8%)	0.005	1.011	0.727, 1.407	0.946
No (n = 135)	35 (25.9%)	100 (74.1%)		1		
Drinks more than 4/5 drinks doses of alcoholic drinks in the same occasion [#]						
Yes (320)	85 (26.6%)	235 (73.4%)	0.101	1.078	0.687, 1.693	0.744
No (69)	17 (24.6%)	52 (75.4%)		1		
Cannabis consumption						
Yes (100)	27 (27.0%)	73 (73.0%)	0.046	1.041	0.726, 1.492	0.828
No (424)	110 (25.9%)	314 (74.1%)		1		
Psychoactive substances consumption						
Yes (23)	05 (21.7%)	18 (78.3%)	0.264	0.825	0.375, 1.816	0.633
No (501)	132 (26.3%)	369 (73.7%)		1		

cPR*, crude prevalence ratio. [#]Only participants who answered "yes" to the question regarding "alcoholic consumpation" were included.

The association verified between the use of psychotropic medications and "being involved in a romantic relationship/living with a partner" when compared to their peers who are not involved in romantic relationships. Although the nature of relationships has not been brought to light, questions arise from this association, as it was not possible to elucidate whether romantic relationships constitute a risk or protective factor in relation to the use of psychotropic medications. It is important to highlight that, healthy romantic relationships can be a social support for students, on the contrary of the dysfunctional ones [31].

Family relationships and social ties, in general, become fundamental for the construction of supporting networks and strategies for coping with mental illnesses [32], highlighting the need for new research, addressing the association observed in university students at UFMT. This in-depth analysis is important, as it can support intervention programs in the area.

In the study, significant results were found for the association between being in postgraduate studies, having a subjective perception of academic insufficiency and using psychotropic medications. This result requires further analysis, considering the number of participants, which demonstrates the need for future studies with larger samples. In a study carried out with more than two thousand postgraduate students in Brazil, most participants indicated they had anxiety and a smaller percentage reported the presence of insomnia, depression, and some sleep-related disorders [2].

According to the literature, postgraduate students are six times more likely to develop anxiety and depression

Table 5. Multiple Poisson's regression analysis of sociodemographic, clinical, and academic factors associated with the use of psychotropic medications in university students.

Variable	aPR*	95% CI	*p*-value
Gender			
Female	1.917	1.319, 2.787	<0.001
Male	1		
Study cycle			
Postgraduate	1.560	1.128, 2.159	0.007
Graduation	1		
Subjective assessment of academic achievement			
Insufficient	1.404	1.096, 1.798	0.007
Sufficient	1		
Has already been diagnosed with a mental disorder?			
Yes	4.864	3.442, 6.873	0.001
Rather not answer	2.449	1.201, 4.995	0.014
No	1		

aPR*, adjusted prevalence ratio.

them undergraduate students [33]. The research line, the scholarship status, and the program length of time, length which has been offered, in addition to the concerns and difficulties inherent to the process, significantly influence the student's level of stress, negatively impacting academic performance [34].

There was also an association between students taking courses in the areas of Engineering and Linguistics, Literature, and Arts when compared with those in Applied Social Sciences in relation to the use of psychotropic drugs. There is an association between the Engineering area and burnout and psychological suffering, such as high-frequency exhaustion and disbelief, in addition to low frequency in the perception of professional effectiveness [35]. Another study, pointed to the area of Literature/Linguistics and Arts, followed by the Applied Human Sciences area, as the protagonists of the risks of episodes of depression—when compared to other courses [36].

An important result refers to the bivariate associations between clinical characteristics and the use of psychotropic medications, which showed significance among students with depressive symptoms, with anxiety symptoms, and with a history of diagnosis of mental disorders or who preferred not to answer this question.

Regarding the anxiety and depression that are affecting university students, the literature suggests several factors which may be associated with the manifestation of these symptoms, such as sociodemographic factors, choice of courses, and academic trajectory, among others [1,37]. According to Gotardo *et al.* [38], the main pathologies described by university students and which led them to use psychotropic medications, were anxiety, followed by depression, showing the high incidence of these mental disorders among students in the university world. In our work, it was possible to highlight the prevalence of previous diagnoses of mental disorders and the use of psychotropic medications, which may suggest psychiatric follow-up by a qualified professional—even so, the risks previously mentioned are likely. Another similar survey also showed the predominant use of antidepressants, such as Fluoxetine and Sertraline, with greater use by those who were prescribed by medical professionals, a fact which did not prevent the manifestation of side effects by users [39]. Some users take more than one medication and some of them, are unaware of the real purpose of the medication they use. Therefore, another important issue is to clarify the patients, regarding to the diagnosis of mental disorder and their participation in the therapeutic proposal, once it can favor adherence [40].

Ultimately, the university phase makes up the life cycle of many Brazilians, generally during adolescence and/or youth. In fact, it is a more or less long period—officially four to six years long—marked by individual and collective experiences which require responsibility and sociability from those who experience this period of life [41]. University students are exposed to stressful events during their undergraduate studies, especially in health area, due to activities in the clinical area, interaction with new individuals, and the fact that they frequently deal with other people in suffering situations [5].

The prevalence of Common Mental Disorders (CMD) in university students is a worrying fact and, due to the increase in the number of publications on the topic in the last five years, it appears that it has worsened [42]. Levels of depressive symptoms, stress and anxiety have increased

around the world, compromising the life quality and well-being of people of different ages [43], not being different in the university population according to the data found in the present study and research that corroborates these findings.

Mental health within universities, goes beyond the biological aspect: it is linked to familiar, social, cultural, and individual contexts. Entering to this environment, allows the subject to live new experiences and values, enabling personal growth but it also can be a space for getting mentally ill. Once mental health has been an extremely relevant topic, and considering its influence on social, individual, and institutional aspects of life in a university context, its promotion can positively influence learning processes, professional training, and institutional retention [7].

It must be highlighted the importance of High Education Institutions (HEIs) in the country, when establishing committees to implement a policy to strengthen the mental health of students from the health area, with the ability to recognize different health needs, including suffering psychological manifestations and linking internal and external actions to the services of the Unified Health System (SUS), to implement and monitor the actions which compounds the mental health policy [44].

Finally, this study has presented some limitations inherent to studies of this nature, especially the short collection period, access to students, and their adherence to the research form. It will also be important, in future studies, to provide greater details on behavioral variables (such as romantic and interpersonal relationships), specific aspects of each course (which may favor psychological distress and the search for psychotropic drugs), in addition to the most used therapeutic classes by UFMT students, as well as the side/adverse effects experienced. On the other hand, researches with this kind of outcome are essential for understanding the risks posed by the treatment of mental disorders in the university environment, especially with psychotropic medications, favoring the construction of a solid basis for student policies and interventions, which could promote comprehensive health and life quality at university.

Conclusions

University life is full of changes and challenges for students, exposing them to variables that may be associated with the development of psychological disorders (such as anxiety and depression symptoms). Surveying the clinical profile of Brazilian university students is important, as it establishes a screening of the population and facilitates the understanding of the variables involved in psychological distress, serving as a basis for coping strategies. At UFMT, the profile of the students was mostly around 20 years old, predominantly female, involved in romantic relationships, and those who chose health-related courses had higher participation and reported the use of psychotropic drugs (generally prescribed by a doctor), with an emphasis on antidepressants (SSRIs). However, there are those who use medication without a prescription, which can be detrimental to health, compromising performance and quality of life.

Availability of Data and Materials

The data that support the findings of this study are available from Cássia Regina Primila Cardoso Berti, Tatiane Lebre Dias and Alice Milani Nespollo.

Author Contributions

CRPCB and EKNA participated in the collection and collaborated in organizing the data and interpreting it. MK was responsible for statistical analysis. The authors SRM, TLD and AMN assisted in the development of the sociodemographic and clinical questions, which were elaborated by the authors of the work, as stated in the "instruments" section of the methodology of this study. However, all the mentioned authors had a significant role in the conception or design of the work, as well as in the acquisition and interpretation of data. CRPCB, TLD and AMN wrote the article and carried out the discussions and interpretations, being responsible for the content of the manuscript, making themselves available for any clarifications regarding the integrity of the information. All authors contributed to the preparation, read and approved the article. All authors contributed to important editorial changes in the manuscript. All authors read and approved the final manuscript. All authors have participated sufficiently in the work and agreed to be accountable for all aspects of the work.

Ethics Approval and Consent to Participate

The research complied with Resolution 466, of December 12, 2012 (National Health Council/Ministry of Health, Brazil), which regulates researches with human beings and was evaluated by the Ethics and Health Research Committee of UFMT (Federal University of Mato Grosso) in Cuiabá, being approved under opinion 5,655,248. Students had free choice to sign the informed consent form (online) and, after acceptance, they were directed to the ques-

tionnaire, which was prepared and was under the responsibility of Professor Dr. Samira Marcon, which have been applied in all UFMT campuses.

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Conflict of Interest

The authors declare no conflict of interest.

References

[1] Silva LS, Da Silva SMC. Learning the trade of a university student: Time of establishment of those entering higher education. Psychology in Magazine. 2019; 25: 960–978.

[2] Costa EG, Nebel L. How much is pain worth? Study on the mental health of postgraduate students in Brazil. Polis, Latin American Magazine. 2018; 50: 207–227.

[3] Barreto S. Depression in young university students. Contemporary Nursing Magazine. 2020; 9: 6–8.

[4] Cardoso HF, Borsa JC, Segabinazi JD. Mental health indicators in young people: Risk and protective factors. Interdisciplinary Studies in Psychology. 2018; 9: 3–25.

[5] Graner KM, Cerqueira ATA. Integrative review: Psychological distress in university students and associated factors. Science and Public Health. 2019; 1327–1346. (In Portuguese)

[6] Andrade AS, Antunes NA, Zanoto PA, Tiraboschi GA, Viana PVBA, Currilla RT. Academic experiences and psychological suffering of Psychology students. Psychology: Science and Profession. 2016; 36: 831–846.

[7] Trigueiro ESO, Barreto LKS, Peixoto COB, Coelho IP, Santos LF, Balena KM, *et al*. Mental Health in University Students: Elements for debate. Interfaces Magazine. 2021; 9: 871–881.

[8] Santos HG, Marcon SR, Baptista MN, Splinder JN, Abreu EKN, Nespollo AM. Sintomas depressives e fatores associados em universitários. In Marcon SR, Dias TL (eds.) Saúde Mental no context universitário: contribuições para um diálogo (pp. 87–104). 1st edn. EdUFMT: Cuiabá. 2021.

[9] Abreu EKDN, Marcon SR, Espinosa MM, Kogien M, Valim MD, Nascimento FCDS. Factors associated to suicide risk in stricto sensu postgraduate students: a cross-sectional study. Revista Latino-americana De Enfermagem. 2021; 29: e3460.

[10] Araújo AFLL, Ribeiro MC, Vanderlei AD. Self-medication of psychotropic drugs among university students of Dentistry and Medicine. Magazine International Higher Education. 2021; 7: e021037.

[11] Amaral CMM. Use of medications for anxiety and depression and associated factors in pharmacy students: a cross-sectional study [bachelor's thesis]. University of São Paulo. 2019.

[12] Oliveira MM, Corage LN, Oliveira BP, Silva LG. Self-medication in academics: A review of Brazilian literature between 2000 and 2017. Health and Research Magazine. 2018; 11: 623–630.

[13] Tovani JBE, Santi LJ, Trindade EV. Use of psychotropic drugs by academics in the health field: a comparative and qualitative analysis. Brazilian Journal of Medical Education. 2021; 45: 1–10.

[14] Leopoldino ALB, Esperandim VR. Use of antidepressants among medical students for depression: an integrative review. Brazilian Journal of Health Review. 2023; 6: 29964–29972.

[15] Lima MG, Álvares J, Guerra AA, Junior, Costa EA, Guibu IA, Soeiro OM, *et al*. Indicators related to the rational use of medicines and its associated factors. Revista De Saude Publica. 2017; 51: 23s.

[16] Pedrosa AADS, Camacho LAB, Passos SRL, Oliveira RDVCD. Alcohol consumption by university students. Cadernos De Saude Publica. 2011; 27: 1611–1621.

[17] Spitzer RL, Kroenke K, Williams JBW, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. Archives of Internal Medicine. 2006; 166: 1092–1097.

[18] Moreno AL, DeSousa DA, De Sousa AMFL, Manfro GG, Salum GA, Koller SH, *et al*. Factor structure, reliability, and item parameters of the Brazilian Portuguese version of the GAD-7 questionnaire. Psychology Topics. 2016; 24: 367–376.

[19] Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. Journal of General Internal Medicine. 2001; 16: 606–613.

[20] Fraguas R, Jr, Henriques SG, Jr, De Lucia MS, Iosifescu DV, Schwartz FH, Menezes PR, *et al*. The detection of depression in medical setting: a study with PRIME-MD. Journal of Affective Disorders. 2006; 91: 11–17.

[21] Gonçalves AP, Zuanazzi AC, Salvador AP, Jaloto A. Validity Evidence for Generalized Anxiety Disorder 7-Item (GAD-7). Psychology and Health. 2023; 15: e15101743

[22] Rufino JV. Depressive symptoms in university students: dimensional analysis of the Patient Health Questionnaire - 9 (PHQ-9) and study of mediators in the association with time spent using social media [PhD's thesis]. State University of Londrina. 2024.

[23] Brazil. National Health Council. Resolution No. 466 of December 12, 2012: guidelines and regulatory standards for research involving human beings. Brasília (DF): MS. 2012.

[24] Field A. Discovering statistics using SPSS. 5th edn. Porto Alegre: Penso. 2020.

[25] Arraes LT, Arraes LSC, Arraes CT, Trajano LASN, Trajano ETL, Silva MAS. Nonmedical use of psychotropic drugs by undergraduate students: an integrative review. Research, Society and Development. 2022; 11: 1–12.

[26] de Farias JC, Jr, Nahas MV, de Barros MVG, Loch MR, de Oliveira ESA, De Bem MFL, *et al*. Health risk behaviors among adolescents in the south of Brazil: prevalence and associated factors. Revista

Panamericana De Salud Publica = Pan American Journal of Public Health. 2009; 25: 344–352. (In Portuguese)

[27] Dos Santos ZMA, Silva MS, Florêncio NLM, Pachú CO. The use of medication by Brazilian university students: a narrative review. Multidisciplinar Scientific Journal. 2023; 4: 1–8.

[28] De Souza JS, De Oliveira JS, De Oliveira JLG, De Almeira LY, Gaino LV, Saint-Arnault DM. Promoting women's mental health: the influence of physical health and the environment. Brazilian Nursing Journal. 2019; 2: 191–198.

[29] Dell'Osbel RS, Dos Santos PA, Menegal G, Da Silva FF, Tonietto PPP, Gregoletto MLO, *et al*. Depressive symptoms and associated factors in university students in southern Brazil. Science & Health. 2018; 11: 217–225.

[30] Dos Santos LB, Nascimento KG, Fernandes AGO, Romanelli-da-Silva TC. Prevalence, severity, and factors associated with depression in university students. Electronic Magazine of Mental Health, Alcohol and Drugs. 2021; 17: 92–100.

[31] Schlösser A. Interface between Mental Health and Love Relationships: A Look from Positive Psychology. Thinking Families. 2014; 18: 17–33.

[32] Silva AMS, Ximenes VM. Discussions about mental health and social support among university students. Human Sciences Magazine. 2022; 15: 1–14.

[33] Evans TM, Bira L, Gastelum JB, Weiss LT, Vanderford NL. Evidence for a mental health crisis in graduate education. Nature Biotechnology. 2018; 36: 282–284.

[34] De Rezende MS, Miranda GJ, Pereira JM, Cornacchione Junior EB. Stress and Academic Performance in Stricto Sensu Postgraduate Studies in Accounting Sciences in Brazil. Educational Policy Analytical Archives. 2017; 25: 1–21.

[35] Dantas LAL, Solano LC, Oliveira LC. Mental health care aimed at women in primary care. New Hope Health Sciences Magazine. 2019; 17: 73–80.

[36] Flesch BD, Houvèssou GM, Munhoz TN, Fassa AG. Major depressive episode among university students in Southern Brazil. Revista De Saude Publica. 2020; 54: 11.

[37] Santana AC, Pereira ABM, Rodrigues LG. School Psychology and Higher Education: Possibilities for professional action. School and Educational Psychology. 2014; 18: 229–237.

[38] Gotardo AL, Da Silva CM, Madeira HS, Peder LD. The use of psychotropic medications by students at a university center in Cascavel, Paraná. SaBios – Health and Biology Magazine. 2022; 17: 1–11.

[39] Damasceno EMA, De Souza MFC, Santos ER, Dos Santos LGJ, Santana BM. Risks of using antidepressants among young university students in the health field. Ajes multidisciplinar Saúde Viva Magazine. 2019; 2: 13–24.

[40] Tavares TR, Coimbra MBP, Oliveira CKR, Bittencourt BF, Lemos PL, Lisboa HCF. Assessment of the use of psychotropic drugs by university students. Journal of Medical and Biological Sciences. 2021; 20: 560–567.

[41] Assis AD, Oliveira AGB. University life and mental health: meeting the health and mental health demands of students at a Brazilian university. Brazilian Mental Health Notebooks. 2010; 2: 159–177.

[42] Rocha SV, de Almeida MMG, de Araújo TM, Virtuoso JS, Jr. Prevalence of common mental disorders among the residents of urban areas in Feira de Santana, Bahia. Revista Brasileira De Epidemiologia = Brazilian Journal of Epidemiology. 2010; 13: 630–640.

[43] Jardim MGL, Castro TS, Rodrigues CFF. Depressive Symptomatology, Stress and Anxiety in University Students. Psico-USF. 2020; 25: 645–657.

[44] Gaiotto EMG, Trapé CA, Campos CMS, Fujimori E, Carrer FCA, Nichiata LYI, *et al*. Responding to the mental health needs of university students: a quick review. Public Health Magazine. 2021; 55: 1–18.