

Analysis of Socioeconomic Profile and Mental Health of Amazon University Students and Its Impact on Learning Process

Abreu A.S¹, Nascimento F.S.¹, Barleta M.L.R.¹, Cunha E.L.¹, Barros, V.N.^{1,2*}

¹Curso de Enfermagem, Faculdade Estácio de Castanhal, Castanhal, PA, Brazil.

²Department of Morphophysiology Science, Universidade Estadual do Pará - UEPA, Belém, PA, Brazil.

*Correspondence:

Vanessa Novaes Barros, Universidade Estadual do Pará – UEPA, Trav. Perebebuí, 2623, Marco 66087670, Belém, PA, Brazil, Phone +55 91 992657474.

Received: 26 November 2020; **Accepted:** 15 December 2020

Citation: Abreu AS, Nascimento FS, Barleta MLR, et al. Analysis of Socioeconomic Profile and Mental Health of Amazon University Students and Its Impact on Learning Process. Int J Psychiatr Res. 2020; 3(3): 1-8.

ABSTRACT

It is estimated that 8 to 15% of university students have some psychiatric disorder during their academic career, especially depressive and anxiety disorders. This is aggravated in the Amazon region as the socioeconomic level is one of the most relevant predictors of well-being and mental health. In this work we investigate the socioeconomic and mental health factors that impact academic learning process. For this, tests were applied to assess cognition (through the mini mental state examination-MMSE), psychic state (through the HAD scale, Beck's depression inventory - BDI and suicide risk index -SRI) as well as assessing the student's social and family situation (through family APGAR) within a period of one year. The results of these tests will be related to the student's performance coefficient (CR), which refers to a number (from 0 to 10) that corresponds to the student's academic performance at the institution. It was observed that 67% of the sample showed decreased cognition according to MMSE, predominantly female, almost half of the sample (49%) presented anxiety, according to HAD, 100% of students with severe depression in BDI also showed anxiety in HAD and 59% of students with severe depression in BDI the risk of suicide was high according to SRI. In addition, there is no relationship between mental disorders and academic performance in these students.

Keywords

Psychiatric disorder

Introduction

The period of higher education demands an adaptive process from university students, which can lead to interferences in the physical and mental health of this population. Regarding the emotional health of university students, the authors highlight the vulnerability and presence of significant emotional symptoms that, if not evidenced, can become harmful to academic students, principally in poor populations like in Amazons. Symptoms related to depression, anxiety and stress have appeared in this population, more significantly when compared to those found in the general population.

Data recently released by the World Health Organization (WHO) more than 322 million people worldwide are living with depression,

being the main cause of health problems nowadays. WHO states that Brazil is the country that presents the highest prevalence in Latin America, affecting about 11.5 million Brazilians, and is also the first place in the world ranking in anxiety. Adewuia et al. [3], reveals that approximately 15 to 25% of the students present some type of psychiatric disorder during graduation.

Anxiety and fear become recognized as pathological when they are exaggerated, disproportionate to the stimulus, or qualitatively different from what is observed as a norm in that age group and interfere with the individual's quality of life, emotional comfort or daily performance [1]. Such exaggerated reactions to the anxiogenic stimulus develop, more commonly, in individuals with an inherited neurobiological predisposition [2].

The use of technology indiscriminately by adolescents causes the cognitive imbalance of being. Thus, it enhances attention disorders,

obsessive disorders, anxiety and problems with language and communication, which directly affects learning [3].

Good academic performance is a significant marker of student success and development, indicating a positive response to competitiveness and the high level of demand existing at the university. This association is subject to bidirectionality, since the already depressed student tends to find greater difficulties in carrying out their daily activities, as well as may be depressed by the low performance achieved [5].

In relation to aversive contingencies, academic experiences that do not guarantee a good quality of life can become stressful experiences, which can both influence the onset depressive disorders, as well as affect academic performance and school dropout [6,7].

Depression and stress can have a great influence on students' university performance. The physical symptoms of depressive disorder (changes in sleep and appetite, reduced energy, fatigue and slowness or psychomotor agitation), associated with psychic symptoms (sadness, low self-esteem, disinterest, hopelessness, death wish, lack of concentration) and social symptoms (withdrawal, lack of interest in leisure and changes in productivity) demonstrate the value of academic environment in its reality so that a more qualified service can be provided to the student [8].

The appearance of functional syndromes is more frequent in fifth year students and residents, which points to a worsening of depressive symptoms in students of the last year. However, among students, the highest averages of psychological distress were concentrated on students at the beginning of the course. The course period can be divided into three major moments: initial, marked by the transition from high school to higher education; medium, where internships begin and a first contact with professional practice; and the end, marked by the beginning of the process of dismissing the student role and entering the job market. Each of these moments is marked by different demands, which can help in understanding the differences in the health profile of students between different periods [10].

It is estimated that 8 to 15% of university students have some psychiatric disorder during their academic career, especially depressive and anxiety disorders. In several cases, depressive symptoms can have repercussions in the cognitive, social and emotional scope of the student's life, such as learning difficulties, declining academic performance, attention difficulties and an increase in the consumption of psychiatric medications, such as antidepressants. Thus, compromising the student's quality of life [8].

According to Bolsoni-Silva and Loureiro [11], among the stressors present in the university environment, the following can be highlighted as risk factors: deficits in social skills, difficulty in dealing with aversive social situations, environmental stressors, negative experiences of adult life and social circumstances. There is also a lack of motivation for studies and the chosen career and

the difficulty to acquire materials and books, principally in Amazon Region where socioeconomic problems are highlighted [8].

The socioeconomic level is one of the most relevant predictors of well-being and mental health [11-13]. Mental illness contributes to perpetuating the cycles of poverty, causing the degradation of the family environment, which for it in turn feeds early negative experiences, sexual discrimination and gender violence [14].

Unemployment, precariousness and job dissatisfaction or stress also have an important influence on illness, vulnerability and early mortality, and can even lead to suicide. In contrast, stability and job satisfaction are associated with well-being and better levels of mental health [15].

In this way, it is suggested that the greater the social involvement of students, the more chances they will have to present satisfactory interpersonal relationships with the institutions in which they study, that is a good interpersonal relationship tends to favor the adaptation process and academic success [16-18].

Those several factors (related or not) to the university student can interfere with their adherence and performance during the academic period. What is happening to these young people? What factors are determinant for dropping out school? Would be social and economic, cognitive or psychological factors? How are these factors related?

Material and Methods

All patients in the present study were studied according to the precepts of the Helsinki Declaration and the Nuremberg Code, respecting the Research Standards Involving Human Beings (Res. 466/12) of the National Health Council, after approval by the Ethics Council. In addition to, the commitment made by the researchers about the confidentiality of the data used, based on the Data Usage Commitment Term and signature by the research subjects of the Terms of Free and Informed Consent.

This research has already been duly submitted and approved by the Ethics and Research Committee of Faculdade Estácio do Amazonas (CEP number 5017) on April 17, 2019 number CAAE: 12107019.9.0000.5017.

The present research is characterized as a longitudinal, prospective, observational, descriptive study, whose target audience is students of Faculdade Estácio de Castanhal (cnpj: 07.931.326 / 0001-81), Castanhal, Pará. 82 students were selected at random, female and male (regardless of time at university). Thus, the study included students of both sexes, without age restriction, regardless of race, income levels or marital status. These students must be enrolled at the Estácio de Castanhal from June 2019 to June 2020. The study excluded students who refuse to participate in the research, or even those who are outside the period established for analysis.

Participating students were submitted to the following assessments/questionnaires:

Data questionnaire, to understand the interpersonal relationships in the different areas (family/academic) of the student, a semi-open questionnaire was carried out, containing open and closed questions. Mazanto (2012) and Moreira (2002), describe that qualitative and quantitative research methods are used to measure opinions, sensations, habits, being a study where the interpretation should be made based on the very perspective of the different individuals who will be part of the (target audience), relating bibliographic data to data collected in the field.

Mini mental state test (MMSE), used for initial mental status screening, evaluates cognitive function, detecting possible declines and the degree of severity in which it is found, the test consists of a 30-point questionnaire, measures functions that include arithmetic, memory and orientation. It consists of questions, which is grouped into categories, each one being responsible for assessing different specificities such as language, visual constructive capacity, 3-word registration, attention and calculation, among others. Less than 28 points is considered cognition decreased as found in Brucki et al., [19].

Beck's depression inventory (BDI), which consists of a self-report questionnaire containing 21 objective questions, and is the most used tool to measure the degree and severity of depressive episodes. Each item has four alternatives, implying increasing degrees of depression, with different values, presenting questions with scores from 0 to 3. The Beck Depression Inventory is probably the most widely used measurer of depression self-assessment in both research and clinic situations [20], is translated into several languages and validated in different countries.

Hospital Anxiety and Depression Scale (HAD) [21], which has 14 items, seven of which are aimed at assessing anxiety (HADS-A) and seven for depression (HADS-D). Each of its items can be scored from 0 to 3, making up a maximum score of 21 points for each scale.

APGAR family scale, which was designed in 1978 by Smilkstein to explore the family's functionality [22]. The family, according to its possibilities, must satisfy the basic needs of its members and is the fundamental means to transmit to the new generations the cultural, moral, spiritual values, customs and traditions of each society [23,24].

Suicide Risk Index (IRIS) Consist of 12 items, organized into three categories (socio-demographic, contexts and suicide sphere). The results indicate that a psychometric instrument that was developed with domains and capabilities to respond to the requests and challenges proposed [25].

For the statistical analysis, the difference in scores between the groups in which the assessment tests were carried out was taken into account. These results will be related to the student's academic performance at the university, measured every six months by the institution's internal program (SIA), where each student has a coefficient of yield (CR) ranging from 0 to 10, with 0 being the

worst performance and 10 being the maximum performance. The analysis will be performed in the BioEstat 5.0 program, the Wilcoxon test, two-tailed ($p < 0.05$) will be applied.

To understand the relationship between MMSE and mental state, the students were divided into six groups: 1. Depressive Group (corresponding to those who presented moderate or severe depression in the BDI without anxiety on the HAD Scale); 2. Anxious Group (corresponding to those who presented anxiety on the HAD Scale with minimal depression in the BDI); 3. Depressive and Anxious Group (corresponding to those who showed anxiety on the HAD Scale and moderate to severe depression on the BDI); 4. Non-anxious group (corresponding to students who did not show anxiety on the HAD scale); 5. Non-depressive group (corresponding to students with minimal depression in the BDI); 6. Non-depressive and non-anxious group (corresponding to those with minimal depression in the BDI and absent anxiety in the HAD Scale).

Results

The epidemiological profile of university students:

Eighty two (82) students from different age groups (Figure 1A), different undergraduate courses, in different semesters (Figure 1B), of both genders (Figure 1C) and of were submitted to all evaluation processes indicated in the method of this work in order to obtain results in a broad and close to the reality of what we experience in education in analyzed region.

When analyzing the general profile of our sample of 82 university students, we obtain a predominant profile of these students: most believe that their family income is sufficient for a good quality of life (62%); had a good childhood (94%); little more than half only feel supported by the family at certain times (51%); 21% have a psychological problem already diagnosed; more than half (55%) think or have thought about dropping out of college; the minority works and, of those who works, more than half do not agree with their remuneration and think that it does not match their attribution (Table 1).

Although most university students claim to obtain sufficient financial resources for a good quality of life, when asked about the value of college, about 40% say that the institution is expensive and it is paid with a lot of effort. This, added to the difficulty of transportation (71% do not have their own vehicle) may be some of the contributing factors to the high dropout rate of university students in Amazon.

We can evidence that the majority of university students from private Higher Education Institutions in Brazil (compared with public Universities) are subjects belonging to lower and middle society class, unlike to what is expected. With government assistance programs such as PROUNI and FIES and others private student financing offered by some banks as well as student financing programs offered by the private Higher Education Institutions, individuals with low and medium financial resources have the opportunity to enter higher education. In this work, we

show that about 86% of the interviewed students have a family income below or equal to 6 minimum wages (less than \$1.110 dollars) and only 6% of them stated family income above 10 minimum wages (\$ 1.850 dollars) (Figure 1D).

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Data Questionnaire	n	yes	n	no	n	sometimes
Do you think that your family income is sufficient for a good quality of life?	(=50)	62%	(=31)	38%	0	-
Do your parents live together?	(=52)	65%	(=28)	35%	0	-
Did you like your infancy?	(=77)	94%	(=5)	6%	0	-
Do you feel supported and safe with your family?	(=40)	48%	(=1)	1%	(=42)	51%
Have you ever run away from home after family disagreement?	(=11)	14%	(=69)	85%	(=1)	1%
Have you ever been diagnosed with a psychological disease?	(=17)	21%	(=63)	79%	0	-
Have you ever thought about dropping out of college?	(=44)	55%	(=36)	45%	0	-
Do you have your own vehicle to go to school?	(=23)	29%	(=57)	71%	0	-
Do you work?	(=28)	36%	(=49)	64%	0	-
Do you think that your salary is fair?	(=12)	44%	(=15)	56%	0	-
Do you feel valued in your work?	(=10)	36%	(=6)	21%	(=12)	43%
Are you satisfied with your professional life?	(=15)	54%	(=13)	46%	0	-
Are you satisfied with your personal life?	(=55)	71%	(=22)	29%	0	-
Do you practice physical activity?	(=37)	45%	(=45)	55%	0	-
Do you play musical instrument?	(=16)	20%	(=63)	80%	0	-
Do you have a religion?	(=66)	85%	(=12)	15%	0	-

Table 1: Results of some questions from Data Questionnaire of university students. The “n” refers to the number of respondents yes (first n), no (second n) and sometimes (third n). The total “n” varies between each question due to the lack of response from some students.

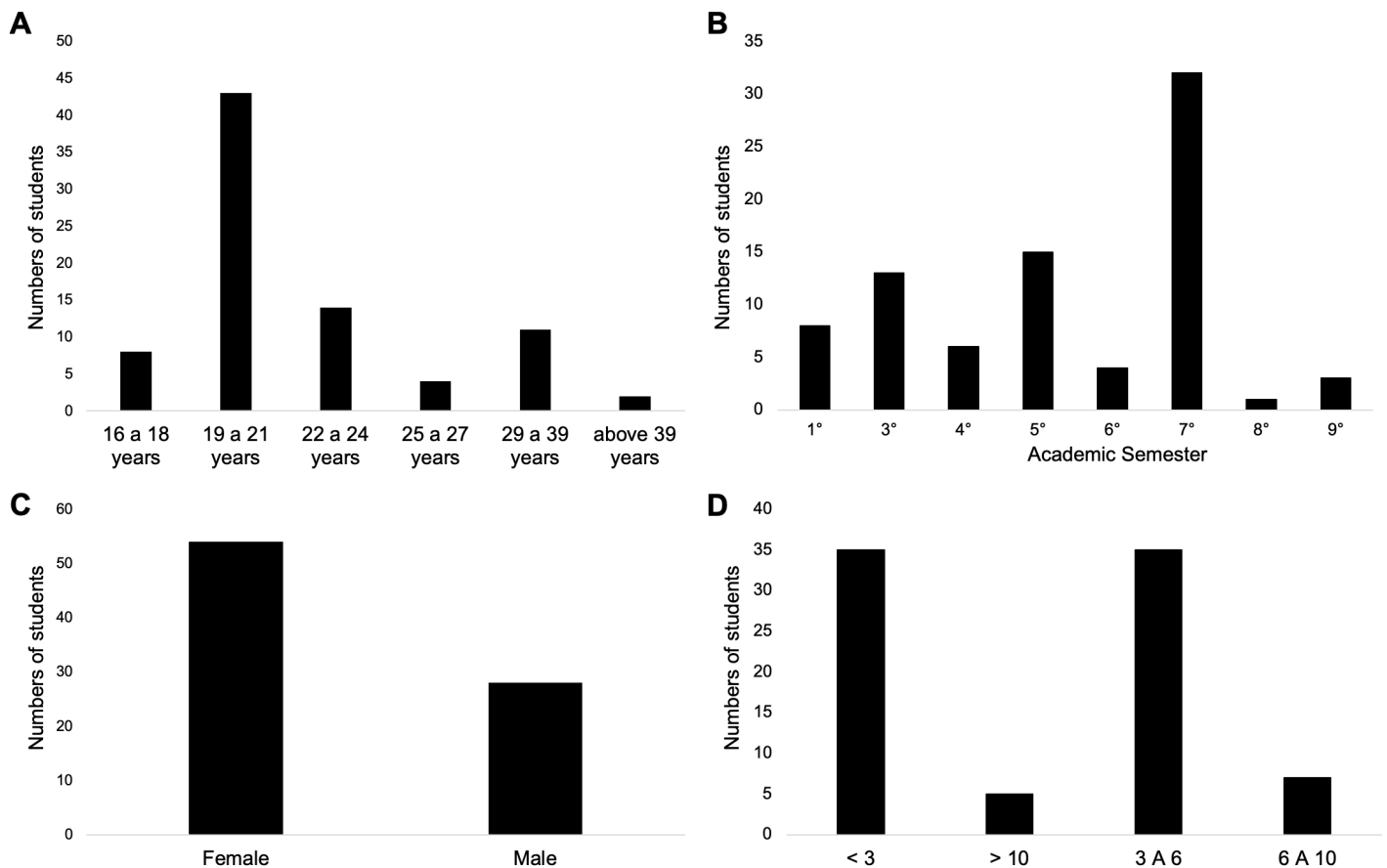


Figure 1: General information about university students: ages (A), academic semester (B), gender (C) and family incomes (D).

Although most university students claim to obtain sufficient financial resources for a good quality of life, when asked about the value of college, about 40% say that tuition is expensive and paid with a lot of effort. This situation, added to the difficulty of transportation (71% do not have their own vehicle), might be some of the contributing factors to the high dropout rate of students at the College.

The Cognitive Assessment of University Students through Mini-Mental State Examination (MMSE)

When assessed using the Mini-Mental State Examination (MMSE), we observed that 67% of the sample had lower scores than expected. This result indicates that more than half of these students have impaired cognition, which can contribute to lower academic performance in higher education (Figure 2).

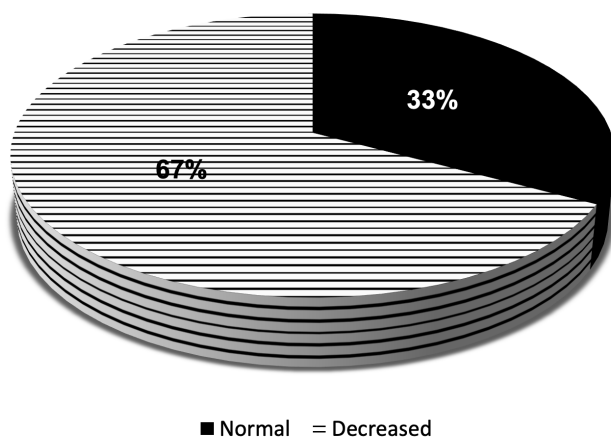


Figure 2: Mini Mental State Exam results (MMSE). Only 33% of students presents normal score in MMSE, 67% of students presents score decreased indicating cognition problems. For those scholarship (9 to 11 years), 28 to 30 points on MMSE is considered normal [19].

In this test, several cognitive domains are analyzed such as: temporal orientation, records, attention and calculation, memory, language and visuospatial orientation. In general, for people with 9 to 11 years of schooling (corresponding to undergraduate students) a score between 28 and 30 points is expected [19]. In our sample, we observed that students scored 27 points on average, 55 students scored less than 28 points and only 27 students scored 28 points or more.

The mnemonic domain was the one that most impacted the students' performance, 56 students were unable to obtain the maximum score in this regard, moreover, during the visuospatial evaluation carried out through the clock test (test that consists of asking the student to draw a clock with hands pointing "fifteen to four") 40 students did not perform the task properly and 2 gave up the activity.

This result portrays a serious problem in the education of the country, which may have originated long before entering higher education. Several factors can interfere with the adequate cognitive performance throughout the development that vary from

feeding during early childhood, the practice of physical activities and stimuli during childhood and adolescence. Another problem may be related to deficient basic education in this country, mainly in public schools. Of the 82 students evaluated, 37 said they had studied secondary and elementary education in private schools and 45 students studied in public schools.

There was also a female predominance regarding cognitive deficit. Among the students who showed impaired cognition, 36 were female and 19 were male.

Evaluation of University Students' Depression and Anxiety

During the application of data questionnaire, 21% of students stated that they were diagnosed with some psychological problem, when asked about the diagnosis, most of them mentioned anxiety, depression and hyperactivity. This report corroborated by the results of the mental assessment tests that pointed out anxiety and depression as diseases of recurrent incidence in the sample.

The students were submitted to mental/psychological status assessment using the Beck Depression Inventory (BDI), Anxiety and Depression Level Scale (HAD) and the Suicide Risk Index (SRI) (Figure 3). In addition, the student's family dynamics was assessed using Smilkstein Family APGAR to verify the coexistence between dysfunctional families and the presence of anxiety and/or depression.

It is clear that, according to the BDI, most of the sample (57%) has minimal or absent depression, 18% mild, 10% moderate depression and 15% severe. On the HAD scale, the highest number of non-depressive students can also be observed (71% of students had absent depression and 29% were present). However, almost half of them (49%) are anxious according to the same scale (HAD) (Figure 3).

We can see a close relationship between anxiety and depression, 100% of students who had severe depression in BDI also showed anxiety in HAD and 92% of these, have depression in the HAD. The most worrying fact is that students with severe depression (according to BDI), 59% had a high risk of committing suicide according to IRIS. Approximately 18% (15 students) of 82 university students evaluated had a high risk of suicide, an amount that, although representing the minority, is quite high if we consider that these are young people with an average age of 21 years old.

Suicide is the second leading cause of death among people aged 15 to 29 years [26]. According to violence map the number of cases of self-harm has increased alarmingly in Brazil. Statistics show the growth in the number of cases in the 1980s, 1990s and 2012, with rates of 2.7%, 18.8% and 33.3%, respectively. In the period between 2002 to 2012, the total of suicides in Brazil increased from 7,726 to 10,321, which showed an increase of 33.6% in that period. In comparison to the country's population growth, in the same interval, the increase in the number of suicides was greater, 11.1%, surpassing in large scale homicides and mortality in transport accidents, which had growth rates of 2.1% and 24.5%, respectively [27].

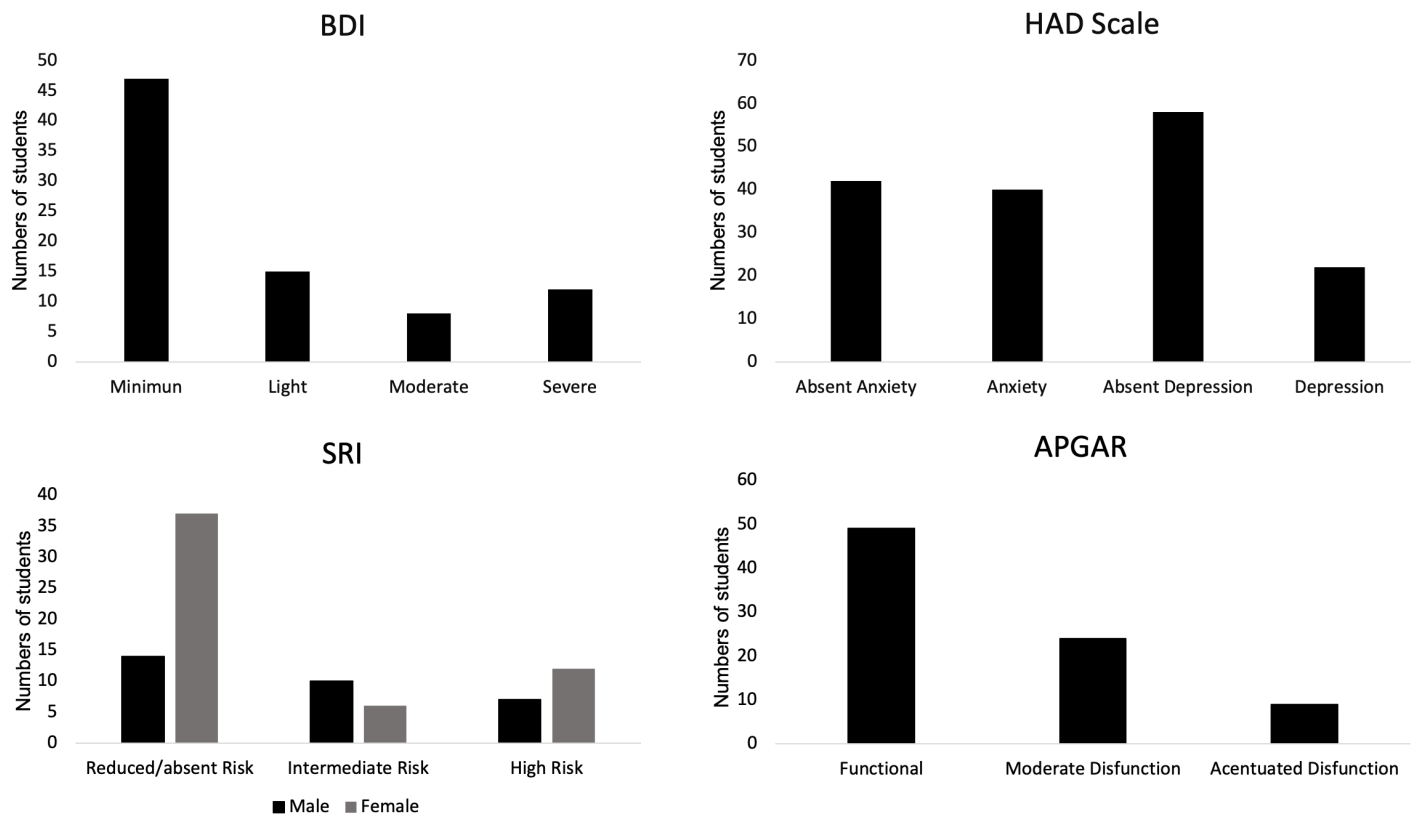


Figure 3: Results of Beck Depression Index (BDI), Hospital Scale for depression and anxiety (HAD Scale), Suicide Risk Index (SRI) and Family APGAR (APGAR) of university students.

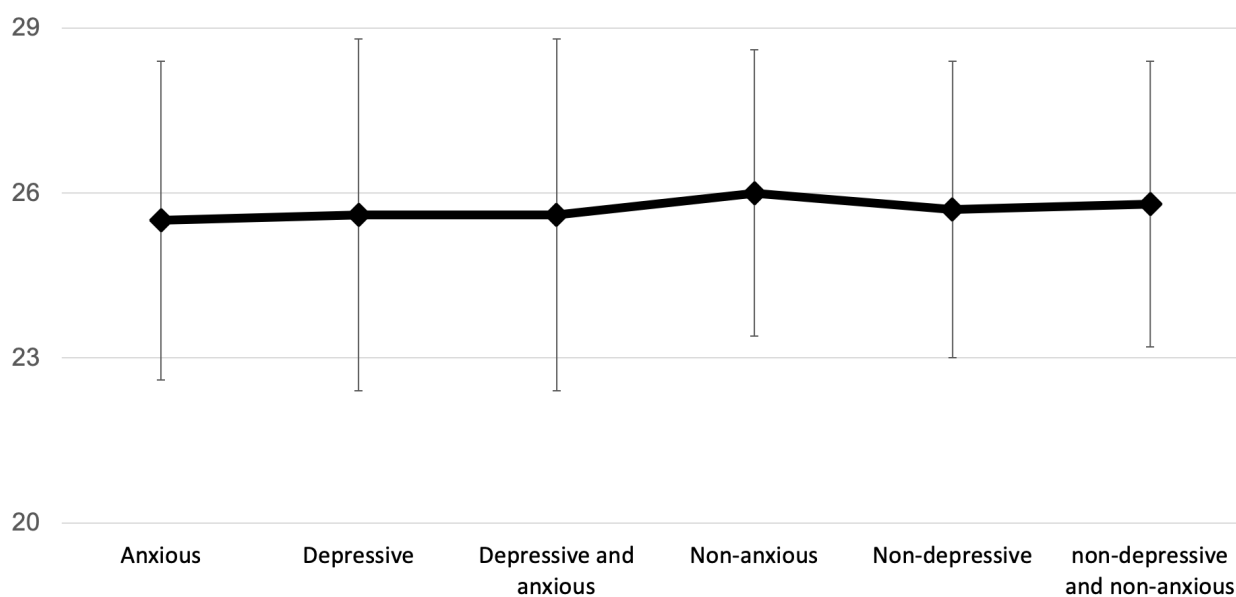


Figure 4: MMSE score between groups. It is observed that there is no statistically significant differences $P > 0.05$ (ANOVA *post hoc* Fisher test was performed considering statistically significant only if $P < 0.05$).

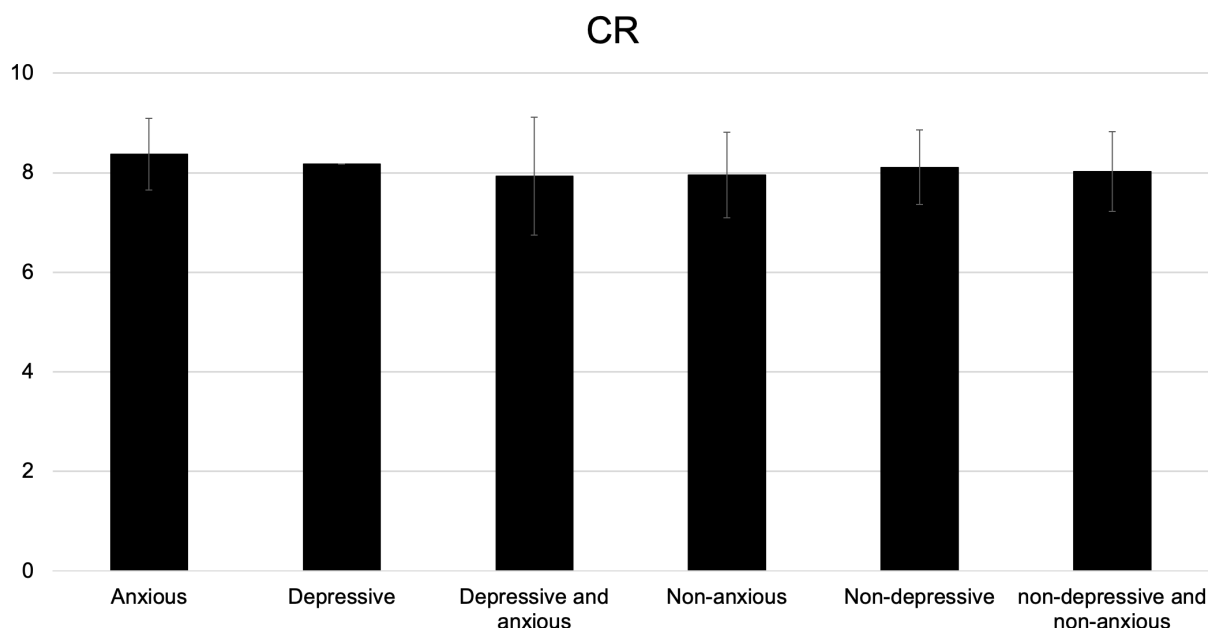


Figure 5: Average score of student's performance coefficient (CR) between groups. It is observed that there is no statistically significant differences $P > 0.05$ (ANOVA *post hoc* Fisher test was performed considering statistically significant only if $P < 0.05$).

The highest number of suicides occurred among students aged 20 to 24 years (46%), among undergraduate students (32%). Brazil is the fourth country in growth of suicide cases in Latin America [26]. The Northern Region, where suicides had a considerable increase: from 390 to 693, an increase of 77.7% between 1980 and 2012, principally in states like Amazonas, Roraima, Acre and Tocantins. The results showed that Pará presented a 46.15% increase in suicide cases among young people, three times greater than the national increase. The most prevalent gender in the state was male, similar to other epidemiological studies of suicide in Brazil [28]. The most common age group was 15 to 19 years, consistent with data in the literature that indicate a higher incidence in groups above 15 years of age [28,29].

Among 82 university students evaluated in this study, only 9 presented marked family dysfunction (10% of the total sample), 24 presented moderate family dysfunction (approximately 30% of the total sample) and 49 students did not present family dysfunction (60%) (Figure 3).

When comparing the mean MMSE score between the groups, we did not observe any statistically significant difference, so in this sample, the degree of anxiety and/or depression does not seem to influence the students' cognitive performance as well as their academic performance (Figures 4 and 5).

There is a significant increase in university students with cognitive disorders in universities (67% of the subject had a lower score than expected in the MMSE), this may be related to deficient basic public education in the Amazon, since most students sampling come from public schools. We can also verify a close relationship between anxiety and depression, 100% of the students who

presented severe depression in the BDI also presented anxiety in the HAD and 92% of these present depression in HAD scale. The most worrying fact is that 59% of students with severe depression (according to BDI), exhibit high risk of committing suicide according to IRIS. Approximately 18% (15 students) of the 82 university students evaluated had a high risk of suicide score, which is quite worrying since they are young people with an average age of 21 years. In addition, in this work, there is no evidence of a relationship between mental disorders and academic performance in these students.

Author Contributions

A.S.A and F.S.N. wrote the project coordinated by V.N.B. The students A.S.A, F.S.N., M.L.R.B. and E. L. C. did all experimental procedures (was involved with questionnaires' application, the student's evaluation, plotting results). V.N.B. designed the project, she did data analysis, coordinated the group, wrote and revised the paper and final approval the version to be published.

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