

## Anxiety and depression indexes in students of three educational programs from the health area

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### Abstract

**Background:** Starting university studies for some students can be a positive and enjoyable experience; however, for others, it can be a stressful and challenging experience, since the start of this stage produces a series of behavioral changes in the student's life style. Several studies indicate that university students develop academic stress that can trigger anxiety and depressive symptomatology. In this regard, it has been reported that a high percentage of bachelor students (11-50 %) develop depressive episodes during the studies.

**Methods:** A descriptive and longitudinal study of new students from three academic programs (medicine, rehabilitation, and nutrition) of the Autonomous University of Yucatán, Mexico, was carried out during 2019-2021. For this, 272 medicine, 171 rehabilitation, and 85 nutrition students were taken into account. In addition, the Beck Depression Inventory was used to determine the prevalence of depression, and to measure anxiety levels, the Hamilton Anxiety Scale was applied to the students.

**Results:** Mild and moderate levels of depression and anxiety were found the students of the three different academic programs. The prevalence of depression (20%) and anxiety (30%) was higher in the students of the educational rehabilitation program, most of whom presented mild depressive symptoms. Both disorders were found mainly in the female gender.

**Conclusions:** It is essential that early identification of the students at risk due to anxiety and depression in the different academic programs. In this way, they can contribute to increasing school performance and physical and emotional students health.

**Keywords:** Anxiety, Depression, Prevalence, Students, Mental Health

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Date of Submission: 08-09-2021

Date of Acceptance: 23-09-2021

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### I. Introduction

Anxiety and depression disorders have become a global concern, as they increasingly affect the population<sup>1,2</sup>. Data from the World Health Organization (WHO), published in 2017, highlight that about 322 million people worldwide suffer from depression, and 264 million suffer from anxiety disorders (between 15% and 18% more than 10 years ago). In other words, it is estimated that 4.4% of the world population suffers from depression and 3.6% from anxiety, which points out that, to a greater extent, fall on women<sup>3</sup>. Now, in the specific case of Mexico, the WHO (in its report WHO 2017) estimated a prevalence for depression of 4.2% (4,936,614 diagnosed cases) and 3.6% for anxiety in the population (4,281,809 diagnosed cases), disorders that worldwide contribute highly to generate disability (7.5% and 3.4%, respectively). In addition to this, it is considered that depression is the leading cause of suicide deaths<sup>3</sup>.

Notably, some studies suggest a higher prevalence of anxiety and depression in university students than in the general population<sup>4-6</sup>. Hence, increasing the demand of the students for greater psycho-pedagogical attention, educational and professional guidance from higher education institutions. Due to this, it is essential to know the negative impacts that anxiety and depression can have on students' academic training and life to reduce school delay, failure, and school dropout.

On the other hand, some studies reported that difficulties in academic activities could trigger anxiety and depressive symptoms<sup>7-9</sup>. Although it is essential to mention that not all students present these symptoms since on other occasions, there are psychosocial determinants such as economic, social, and cultural situations, as well as the academic and emotional stress perceived by each of the students.

In this sense, some studies reported that students in the health area have a higher prevalence of anxiety (33.8%,<sup>9</sup>) and depression (27.2%,<sup>6</sup>). However, most of the studies focus on medical students. Both conditions vary according to the year of schooling and the gender of the students. Interestingly, the study by Bassols et al., 2014, reported a prevalence of anxiety of 30.8% in medical students who were in the first year, while students

who were in the last year of their studies had a prevalence of 9.4%, being women who had a higher prevalence<sup>7</sup>. Similarly, a study conducted at the University of Wollongong in Australia determined a prevalence of anxiety of 45.1% in students in the first three years of medicine<sup>10</sup>. While in another study, a prevalence of 23.8% of anxiety and 39.5% of depressive symptoms was found in psychology and health students<sup>8</sup>.

These results showed that a high percentage of students in the health area experience high loads of anxiety and depression, even above the population mean (3.6% anxiety and 4.4% depression). On the other hand, it is essential to mention that most of the literature reports that levels of anxiety and depression occur more frequently in women than in men (3:1).

Notably, other studies reported an association between anxiety and depressive symptoms with school dropout, poor academic performance, impact on attention span, and suicidal ideation<sup>11-13</sup>. For this reason, it is essential that in the different academic programs, early identification of students who are at risk due to the presence of both disorders is carried out, since in this way and with appropriate interventions, it can contribute to increasing school performance and the emotional health of students. Due to this, the present study was carried out to determine the prevalence of anxiety and depression during 2019-2021 in new students of three educational programs (medicine, rehabilitation, and nutrition) of the Autonomous University of Yucatán, Mexico.

## II. Material And Methods

A descriptive and longitudinal study of new students from three academic programs (medicine, rehabilitation, and nutrition) of the Autonomous University of Yucatán, Mexico, was carried out during 2019-2021. For this, 272 medicine, 171 rehabilitation, and 85 nutrition students were considered.

Each student has explained what study consisted of and the objective pursued. At the same time, possessing consent was requested to be part of the study. The research was supported by the Ethical Codes established in the Declaration of Helsinki (2003) and compliance with the General Regulations of the General Health Law on Health Research in Mexico (RLGS, 1987). They were given a detailed letter with accessible language, which emphasized the absolute confidentiality of their data, which were used exclusively for the study; anonymity was always guaranteed.

The Beck Depression Inventory was used, one of the most widely used scales globally, to measure the severity of depression in both inpatient and outpatient samples. The instrument consists of 21 items of symptoms and attitudes, of these, 14 items correspond to symptoms of a cognitive and affective nature and 7 to somatic and behavioral symptoms, each one scored on a scale of 1-4 as follows: very few times, sometimes, many times and almost always. The scale has Cronbach's alpha = 0.87 (Jurado et al., 1998). According to this Inventory, the Depression Indices were taken as follows: 0-9 represent mood swings that are considered normal, 10-16 mild depressive states, 17-29 with moderately depressed states, 30- 63 severe depression<sup>14</sup>.

To measure anxiety levels, the Hamilton Anxiety Scale<sup>15</sup> was applied. This instrument has 14 items. Each item is scored on a scale of 0 (not present) to 4 (severe), with a total score range of 0–56, where scores <17 indicates no anxiety, 18–24 mild to moderate severity, and 25–30 moderate to severe.

Descriptive data analysis was performed with the GraphPad Prism version 8 program (GraphPad Software, Inc., La Jolla, USA). The data are expressed as percentages and frequencies of each of the variables studied.

## III. Result

This study evaluated depression and anxiety indices in 529 students from three different academic programs in health sciences (medicine, rehabilitation, and nutrition). 273 medical students were considered in the study (95 for 2019, 95 for 2020, and 83 for 2021). From the rehabilitation program, 171 students are represented by 55 during 2019, 61 in 2020, and 55 in 2021. From the nutrition program, 85 students were represented by 28 students during 2019, 29 in 2020, and 28 during 2021.

Table 1 shows the prevalence rate of depression found during 2019-2021 for the three academic programs. Note that the highest prevalence rate of depression was found in Rehabilitation students.

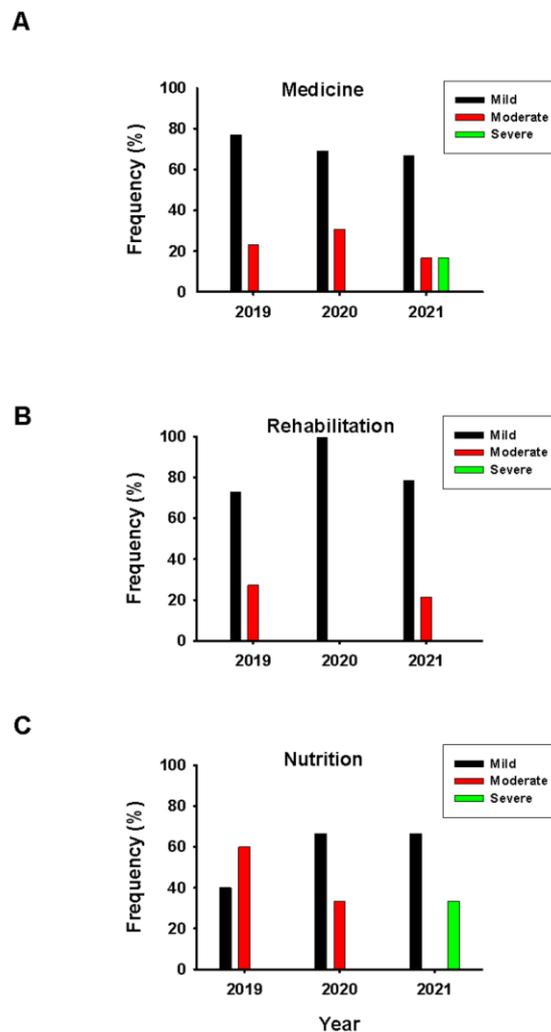
**Table 1.** Depression prevalence in students of three educational programs

Year	Medicine (%)	Rehabilitation (%)	Nutrition (%)
2021	12 (14.5)	14 (25.5)	3 (10.7)
2020	13 (13.7)	9 (15.5)	3 (10.3)
2019	13 (13.7)	11 (20)	5 (17.9)

Subsequently, the genders of the students who presented with depressive symptoms were analyzed. It was found that the female gender was the one that presented the most remarkable depressive symptoms for the medicine program except for the year 2020, during 2019 it was 53.8%, for 2020, it was 38.5%, and for 2021, it was 66.7%. Similarly, for the rehabilitation program, the female gender was the one that presented the most

remarkable depressive symptoms during 2019 (90.1%); for 2020, it was 88.9%, and for 2021, it was 92.9%. While for the nutrition program, the female gender presented more significant depressive symptoms with 100% in 2019 and 66.7% for 2020 and 2021.

Figure 1 shows the severity of depressive symptoms. For the medicine program, it was found that mild symptoms prevailed in 70.9% of cases, followed by 23% of moderate depression. In this study program, only 2 cases of severe depressive symptoms were found in 2021 (Figure 1A). For the Rehabilitation program, it was found that mild depression predominated, followed by moderate symptoms, not finding any case of severe depression during the three years studied (Figure 1 B). While for the nutrition program, it was found that mild and moderate symptoms predominated, and only one case of severe symptoms was found during 2021 (Figure 1C).



**Figure 1.** Frequency and severity of depression in students of three different academic programs. A. Shows the level of depression in medical students, mild (black), moderate (red), and severe symptoms (green). B. Severity of depression in rehabilitation students. C. Level of depression in nutrition students.

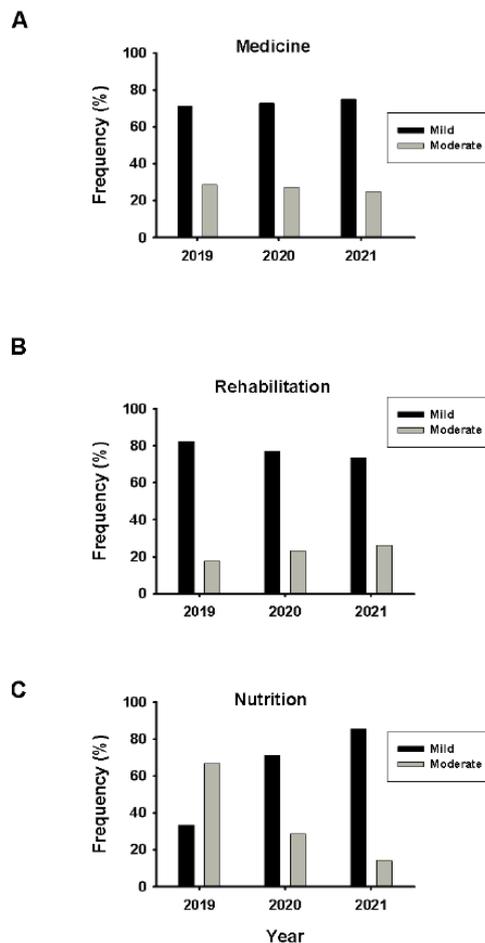
On the other hand, the prevalence of anxiety symptoms in the three different educational programs was analyzed (Table 2). Note that the highest prevalence rate of anxiety was found in rehabilitation students.

**Table 2.** Anxiety prevalence in in students of three educational programs

Year	Medicine (%)	Rehabilitation (%)	Nutrition (%)
2021	16 (19.3)	17 (30.9)	7 (25)
2020	22 (23.2)	13 (21.3)	7 (24.1)
2019	21 (22.1)	19 (34.5)	6 (21.4)

Subsequently, the genders of the students who presented anxious symptoms were analyzed. It was found that the female gender was the one that presented the most outstanding anxiety symptoms for the medicine program except for 2020; during 2019, it was 57.1%, for 2020, it was 45.5 %, and for 2021, it was 75%. Similarly, for the rehabilitation program, the female gender was the one that presented the most significant anxiety symptoms during 2019 with 89.5%, for 2020, it was 76.9%, and for 2021 it was 88.2%. Finally, the female gender presented more significant anxiety symptoms in the nutrition program with 100% in 2019, 85.7% for 2020, and 71.4% for 2021.

Figure 2 shows the severity of the anxiety symptoms. For the medicine program, it was found that mild symptoms predominated in 73% of cases, followed by 27% moderate/severe anxiety (Figure 2A). For the Rehabilitation program, it was found that mild anxiety predominated, followed by moderate/severe symptoms (Figure 2B). While for the nutrition program, it was found that moderate/severe symptoms (67%) and mild symptoms (33%) predominated during 2019, reversing this relationship during 2020 and 2021 (Figure 2C).



**Figure 2.** Frequency and severity of anxiety in students of three different academic programs. A. Shows the level of depression in medical students, mild (black), moderate/severe (grey). B. Severity of anxiety in rehabilitation students. C. Level of depression in nutrition students.

#### IV. Discussion

This study investigated the prevalence of depression and anxiety in new university students from the health sciences area of the Autonomous University of Yucatán. It was found that the prevalence of depression was higher in the students of the educational rehabilitation program (~20%), most of whom presented mild depressive symptoms. While in medical students it was close to 15% and in nutrition students to 13%. For the three educational programs, it was found that the female gender was the one that presented the most remarkable depressive symptoms (~70%). Regarding anxiety in the total sample, a higher prevalence was found in rehabilitation students (~30%). While in medicine and nutrition students it was close to 20%. With a higher prevalence in the female gender. It is striking that most of the studies consulted in the literature reported levels of depression and anxiety more frequently in women than in men (3:1). For example, the prevalence of depression reported for students in the health areas ranges between 11-50%, according to a meta-analysis study

<sup>6</sup>. Similar results were published in a study conducted in Canada, where a prevalence of depressive indices was reported in 24% of medical students. In addition, 45.3% prevalence was reported in medical students from India <sup>16</sup>, and 57.9% from Pakistan <sup>17</sup>.

Regarding anxiety, various studies showed that health science students present a prevalence of anxiety of 33.8% <sup>9</sup>, 30.8% <sup>7</sup>, and 27% <sup>5</sup>. However, our results differ from the study reported by Chandavakar, Azzam, and Mathews in 2017, who reported a prevalence of anxiety of 11.5% for medical students <sup>18</sup> and with the work of Casey et al., 2016 where levels of anxiety were reported 45% <sup>10</sup>. As can be seen, a high percentage of students in the health area experience high levels of depression and anxiety, even above the population mean (4.4% and 3.6%, respectively). However, it is worth noting that the statistics vary considerably in some cases, which can be caused by the type of educational program and the different instruments and inventories used. Likewise, it should be considered that both levels of anxiety and depression have been associated with students' biological and psychosocial vulnerabilities. According to various authors, these vulnerabilities added to the demands of university life (academic demands, inappropriate rest and sleep times, exams, homework, administrative procedures, etc.) can exacerbate the presence of some psychological disorders such as anxiety and depression <sup>5, 7, 19</sup>. Although it has been reported that the presence of high levels of anxiety and depression in university students in the health area, it is also valid emphasize that multiple factors can promote these problems, among which we can mention family situations and the social and economic aspects of the students.

In addition, it should be noted that despite the high rates of anxiety and depression among university students, few studies focus on the role that educators and higher education institutions must comply with to address such situations.

Considering the high levels of anxiety and depression of the students, the implementation of strategies aimed at reducing these situations is required. Some of them could be workshops on relaxation methods and time organization to have better control over their university activities.

Students' health can also be improved by strengthening the psychological and social environment. However, this requires a better understanding of each risk factor that affects their physical, emotional, and mental health. Therefore, it is necessary to promote proposals and appropriate actions to meet their physical, social, and academic needs. For example, work can be done to identify and manage mental health problems through psychological interventions and provide individualized support through tutoring and academic advice to reinforce learning and a good time organization. Another critical point is promoting scholarships or methods of financing studies or strengthening social relations, leisure, and productivity.

In this sense, some authors suggest that psychosocial, relaxation and cognitive restructuring interventions can improve the quality of life of students <sup>20-22</sup>. However, given the high prevalence of anxiety and depression among university students, it is essential to evaluate the effectiveness of these initiatives to try to solve these problems adequately.

## V. Conclusion

Prevalence of depression was higher in the students of the educational rehabilitation program (~20%), most of whom presented mild depressive symptoms were found. While in medical students it was close to 15% and in nutrition students 13%. The highest prevalence of anxiety was found in rehabilitation students (~30%). While in medicine and nutrition students it was close to 20%. Therefore, it is essential that in the different academic programs, early identification of the students at risk due to anxiety and depression. In this way, they can contribute to increasing school performance and physical and emotional students' health.

## Acknowledgments

We want to thank David Chable Maldonado and Estefany Cuevas for the technical support to carry out this study. All other authors reported no financial interests or potential conflicts of interest.

## References

- [1]. Griggs, S. (2017). Hope and mental health in young adult college students: an integrative review. *J. PsychosocNurs Mental Health Serv.* 2017; 55(2), 28-35.
- [2]. Pérez-Padilla Elsy Arlene, Cervantes-Ramírez Víctor Manuel, Hijuelos-García Nayeli Alejandra, Pineda-Cortés Juan Carlos, Salgado-Burgos Humberto. Prevalencia, causas y tratamiento de la depresión Mayor. *Rev. Biomédica.* 2017; 28(2): 73-98.
- [3]. World Health Organization [WHO]. Depression and other mental common disorders. Global health estimates. 2017. Retrieved from: <https://apps.who.int/iris/bitstream/handle/10665/254610/WHO-MSD-MER-2017.2-eng.pdf>.
- [4]. Ho, W. K., Bressington, D., Karatzias, T., Chien, W. T., Inoue, S. et al. Patterns of exposure to adverse childhood experiences and their associations with mental health: a survey of 1346 university students in East Asia. *Soc Psychiatry Psychiatr Epidemiol.* 2019. Doi: 10.1007/s00127-019-01768-w.
- [5]. Mao, Y., Zhang, N., Liu, J., Zhu, B., He, R. and Wang, X. A systematic review of depression and anxiety in medical students in China. *BMC Med Educ.*, 2019; 19(1): 327. Doi: 10.1186/s12909-019-1744-2.
- [6]. Rotenstein, L. S., Ramos, M. A., Torre, M., Segal, J. B., Peluso M. J., et al. Prevalence of Depression, Depressive Symptoms, and Suicidal Ideation Among Medical Students: A Systematic Review and Meta-Analysis. *JAMA*, 2016; 316(21): 2214-2236. Doi: 10.1001/jama.2016.17324.

- [7]. Bassols, A. M., Okabayashi, L. S., Silva, A. B., Carneiro, B. B., Feijó, F., Guimarães, G. C., Cortes, G. N., Rohde, L. A. and Eizirik, C. L. First- and last-year medical students: is there a difference in the prevalence and intensity of anxiety and depressive symptoms? *Braz J. Psychiatry*. 2014;36(3): 233-40.
- [8]. Othman, N., Ahmad, F., El-Morr, C. and Ritvo, P. Perceived impact of contextual determinants on depression, anxiety and stress: a survey with university students. *Int J Ment Health Syst* 2019;2: 13-17. Doi: 10.1186/s13033-019-0275-x
- [9]. Quek, T. T., Tam, W. W., Tran, B. X., Zhang, M., Zhang, Z., Ho, C. S. and Ho, R. C. The Global Prevalence of Anxiety Among Medical Students: A Meta-Analysis. *Int J Environ Res Public Health*. 2019;16(15): E2735. Doi: 10.3390/ijerph16152735.
- [10]. Casey, D., Thomas, S., Hocking, D. R. and Kemp, A. Graduate-entry medical students: older and wiser but not less distressed. *Australas Psychiatry*. 2016;24(1): 88-92. Doi: 10.1177/1039856215612991
- [11]. Foltyn, W., Nowakowska, Z. E., Knopik, J. and Brodziak, A. The Influence of Early Childhood Experiences on Depression Among Medical Students. Preliminary Study. *Psychiat Pol*. 1998; 32: 177-185.
- [12]. Givens, J. L. and Tjia, J. Depressed Medical Students' use of Mental Health Services and Barriers to Use. *Acad Med*. 1986; 77: 918-921.
- [13]. Zoccolillo, M., Murphy, G. E. and Wetzel, R. D. Depression Among Medical Students. *J Affect Dis*. 1986; 11(1): 91-96.
- [14]. Jurado, S., Villegas, M. E., Méndez, L., Rodríguez, F., Loperena, V., & Varela, R. La estandarización del Inventario de Depresión de Beck para los residentes de la Ciudad de México. *Salud Mental*. 1998; 21: 26-31.
- [15]. Hamilton M. The assessment of anxiety states by rating. *Br J Med Psychol*. 1959; 32:50-55.
- [16]. Gupta, S. and Basak, P. Depression and type D personality among undergraduate medical students. *Indian J Psychiatry*. 2013; 55(3): 287-289.
- [17]. Kumar, B., Shah, M. A., Kumari, R., Kumar, A., Kumar, J. and Tahir, A. Depression, Anxiety, and Stress Among Final-year Medical Students. *Cureus*. 2019; 11(3). Doi: 10.7759/cureus.4257
- [18]. Chandavarkar, U., Azzam, A. and Mathews, C. A. Anxiety symptoms and perceived performance in medical students. *Depress Anxiety*. 2007; 24(2): 103-111.
- [19]. Nahar, V. K., Davis, R. E., Dunn, C., Layman, B., Johnson, E. C., Dascanio, J. J., Johnson, J. W. and Sharma, M. The prevalence and demographic correlates of stress, anxiety, and depression among veterinary students in the Southeastern United States. *Res Vet Sci*. 2019; 125:370-373. Doi: 10.1016/j.rvsc.2019.07.007
- [20]. Janke, S., Rudert, S. C., Marksteiner, T. and Dickhäuser, O. Knowing one's place: Parental educational background influences social identification with academia, test anxiety, and satisfaction with studying at university. *Front Psychol*. 2017; 8:1326. Doi: 10.3389/fpsyg.2017.01326
- [21]. Rith-Najarian, L. R., Boustani, M. M. and Chorpita, B. F. A systematic review of prevention programs targeting depression, anxiety, and stress in university students. *J Affect Disor*. 2019; 257: 568-584. Doi: 10.1016/j.jad.2019.06.035
- [22]. Wach, F. S., Karbach, J., Ruffing, S., Brünken, R. and Spinath, F. M. University students' satisfaction with their academic studies: Personality and motivation matter. *Front Psychol*. 2016; 7(55). Doi: 10.3389/fpsyg.2016.00055

Pérez Padilla Elsy Arlene, et. al. "Anxiety and depression indexes in students of three educational programs from the health area." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 20(09), 2021, pp. 59-64.