

## Depression, anxiety and their association with sociodemographic variables in university students from Coahuila

## Depresión, ansiedad y su asociación con variables sociodemográficas en estudiantes universitarios de Coahuila

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### Abstract:

The study aimed to correlate and generate predictive models of anxiety and depression with sociodemographic variables in 398 university students aged 18 and 76, mostly women (78.4%). A quantitative, cross-sectional, and predictive study was conducted through a non-experimental design, applying a questionnaire with sociodemographic data and the Hospital Anxiety and Depression Scale. Among the main results, it was found that more than 60% reported the presence of anxiety, and 30% obtained depression scores. Correlations of anxiety with age, sex, and completed schooling, and of depression with age, completed schooling, and monthly income were identified. Finally, two linear regression models were developed with small effect sizes that predict the presence of anxiety and depression based on family monthly income ( $\beta = -.734$ ) and completed schooling ( $\beta = -.772$ ). It concludes and discusses the relevance of anxiety and depression care in university students, the variables with significant correlations, and considered in the predictive models for their consideration in intervention proposals from school contexts and to generate a healthy development in personal, labor, and social areas of students of said level.

### Keywords:

Anxiety, depression, university students, sociodemographic variables

### Resumen:

El objetivo del estudio fue correlacionar y generar modelos predictivos de la ansiedad y depresión con variables sociodemográficas en una muestra de 398 estudiantes universitarios de entre 18 a 76 años, en su mayoría mujeres (78.4%). Se realizó un estudio cuantitativo, transversal y predictivo a través de un diseño no experimental, aplicando un cuestionario con datos sociodemográficos y la Escala de Ansiedad y Depresión Hospitalaria. Entre los principales resultados se encontró que más del 60% reportó presencia de ansiedad y 30% obtuvo puntuaciones de depresión; se identificaron correlaciones de la ansiedad con la edad, el sexo y la escolaridad terminada, y de la depresión con la edad, la escolaridad terminada y el ingreso mensual; finalmente se desarrollaron dos modelos de regresión lineal con magnitudes del efecto pequeñas que predicen a partir de las variables de edad ( $\beta = -.241$ ), sexo ( $\beta = -.128$ ) y estado civil ( $\beta = .116$ ) la presencia de ansiedad, y la depresión a partir del ingreso mensual familiar ( $\beta = -.734$ ) y la escolaridad terminada ( $\beta = -.772$ ). Se concluye y discute sobre la relevancia de la atención de la ansiedad y depresión en estudiantes universitarios, las variables con correlaciones significativas y consideradas en los modelos predictivos, para su consideración en propuestas de intervención desde contextos escolares y con el objetivo de generar un sano desarrollo personal, laboral y social de estudiantes de dicho nivel.

### Palabras Clave:

Ansiedad, depresión, universitarios, variables sociodemográficas

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## INTRODUCTION

Mental health problems among university students have received increasing attention in recent years, especially considering the profound impact of the COVID-19 pandemic. According to the World Health Organization (WHO, 2020), young people and adolescents experienced a notable increase in the risk of developing symptoms of anxiety and depression during the pandemic. Two years later, the WHO (2022) warned of an alarming deterioration in the mental health of adolescents worldwide, explicitly highlighting the rise in these two conditions.

Among the most vulnerable groups, university students have been particularly affected, with studies reporting elevated levels of anxiety and depression. For instance, Saravia-Bartra et al. (2020) found a significant association between the presence of anxiety and being female and younger among medical students. Several other investigations have consistently reported higher anxiety levels in women compared to men (Chacón et al., 2021; Gutiérrez-García & Landeros-Velázquez, 2018; Íñiguez-Berrozpe et al., 2020; Monterrosa-Castro et al., 2021; Zuñiga & Soto, 2021).

Anxiety among university students has also been associated with relevant psychological variables such as self-concept dimensions (physical, social, family, intellectual, personal, and control) (Guevara-Cordero et al., 2019), addiction to social media and low self-esteem (Portillo-Reyes et al., 2021), and lifestyle factors like increased television consumption (Íñiguez-Berrozpe et al., 2020).

On the other hand, depression is a complex and heterogeneous clinical condition (Kashihara et al., 2019) that affects a significant proportion of the global population (WHO, 2022). University students have been identified as a vulnerable group prone to developing depressive symptoms (Akhtar et al., 2020).

However, data regarding the prevalence and characteristics of depression among students, particularly in low- and middle-income countries, remains limited. In a systematic review, Akhtar et al. (2020) estimated the overall prevalence of depressive symptoms among university students in these regions to be approximately 24%.

Furthermore, demographic and lifestyle variables such as age, sex, living situation, and sports participation are not always considered in the analyses, despite evidence suggesting their influence on mental health outcomes (Cheung et al., 2020). For example, students who migrate to study in cities different from their hometowns or those involved in competitive sports teams have shown greater emotional vulnerability (Cheung et al., 2020). Sociocultural factors also shape both attitudes toward depression and the type of support provided to individuals experiencing mental health problems (Kashihara et al., 2019).

Anxiety and depression frequently co-occur, exacerbating emotional distress among students. Studies have demonstrated strong correlations between these conditions (Zuñiga & Soto, 2021). Vinaccia and Ortega (2020), analyzing a sample of

Colombian university students, reported anxiety symptoms in over 55% of participants, depressive symptoms in more than 32%, and comorbidity in nearly 29%. Similarly, Monterrosa-Castro et al. (2021) found that 49.8% of Colombian health sciences students presented symptoms of anxiety, and 80.3% showed depressive symptoms, suggesting that the demanding nature of academic programs in the health field impacts emotional stability.

Other risk factors have also been identified. Students living away from their families or participating in high-performance sports groups have reported elevated anxiety and depression levels (Cheung et al., 2020). Furthermore, comorbid anxiety and depression in students have been associated with substance use (Trocéz et al., 2020; Leonangeli et al., 2022), experiences of partner violence (Tarriño-Concejero et al., 2023), and suicidal behaviors (Granados et al., 2020), highlighting the severe repercussions of these conditions.

Given this context, understanding the prevalence and the sociodemographic variables associated with anxiety and depression in university populations becomes crucial. Knowledge in this area can guide intervention strategies to promote student well-being and academic success (Ribero et al., 2020).

Thus, the objective of the present study was to analyze the correlations and generate predictive models considering sociodemographic variables and their relationship to symptoms of anxiety and depression among university students at a higher education institution in northern Mexico.

## METHOD

### *Type and research design*

A quantitative approach study was applied, with a correlational and predictive scope. Data was collected was done cross-sectionally, and the design was non-experimental since the variables were not manipulated.

### *Participants*

The sample was obtained from volunteer subjects and consisted of 398 students, ages 18 to 76, with an average age of 21.23. Of these, 78.4% were women, and 90.5% were studying at the bachelor's or engineering level; the rest were studying some postgraduate program.

### *Instruments*

A questionnaire was applied to collect sociodemographic data and the Hospital Anxiety and Depression Scale (HADS), which is made up of 12 items on a Likert scale from 0 to 3 that goes from never to always or almost always. It has validation studies for the Mexican population (Yamamoto-Furusho et al., 2018) and high internal consistency results ( $\alpha = 0.88$ ).

### *Procedure*

The data were collected at a public university in Coahuila through an electronic form distributed to teachers, tutors, and

managers between August and September 2022. The study is part of the variables analyzed and from which information is collected within an interdisciplinary work group generated by the Health and Wellbeing Observatory of the State of Coahuila.

#### Ethical aspects

Regarding the ethical aspects, those established in the psychologist's ethical code and the Declaration of Helsinki were followed. The educational authorities approved the application, and participants gave their informed consent to participate.

#### Information processing

Firstly, the database was obtained in Excel, which was reviewed and cleaned for coding. Subsequently, the IBM SPSS statistical package in version 26 was used to process the information. It began by generating descriptive statistical data to characterize the sociodemographic aspects of the sample. Secondly, it was found that there was no normal distribution, so non-parametric tests were applied; Correlational analyses were run with Spearman's Rho between the study variables, and finally, a multiple linear regression analysis that sought to find the variables that explained anxiety and depression to a greater extent in the sample of students.

## RESULTS

Regarding the descriptive results, it was found that students between 18 and 76 years old participated with an average of 21.23, mostly women (n= 312), and only 21.6% were men (n= 86). The participating students were enrolled in 21 different Schools or Faculties, covering the professional areas of health, social, exact, administrative, and engineering; the majority had a single marital status (n= 364). Data on cigarette and alcohol consumption in the last month were also collected. Regarding alcohol consumption, the age of initiation of consumption was also questioned, which had an average of 14.41 years.

Regarding anxiety levels, 34.92% did not report symptoms, 28.89% reported the presence of symptoms, and 36.18% obtained scores that correspond to a clinical picture of anxiety. Regarding the sociodemographic variables of the total of women, 68% had indicators of the presence of symptoms and clinical symptoms of anxiety, and 53% of the men.

Likewise, regarding the level of study, analyzing the total of high school and undergraduate students, they had levels of 66 and 62.5% respectively of the presence of symptoms or clinical symptoms. The analysis of frequencies and percentages can be seen in Table 1

Table 1. Frequency and percentage of sociodemographic variables based on the qualitative classification of Anxiety.

	Absence	Presence of clinical symptoms
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	Freq. (%)	Freq. (%)	Freq. (%)
Sex			
Women	99 (24.87)	95 (23.86)	118 (29.64)
Man	40 (10.05)	20 (5.02)	26 (6.53)
Completed schooling			
High School	122 (30.65)	101 (25.38)	137 (34.43)
Bachelor/Engineering	12 (3.02)	13 (3.27)	7 (1.75)
Maester	3 (0.75)	0 (0)	0 (0)
PhD/ Doctorate	2 (0.50)	1 (.25)	0 (0)
Marital status			
Single	126 (31.67)	102 (25.64)	136 (34.18)
Married	9 (2.26)	6 (1.50)	3 (.75)
Divorced	2 (.50)	2 (.50)	0 (0)
Free union	2 (.50)	5 (1.25)	5 (1.25)
Monthly income			
< of 6,800	65 (16.34)	51 (12.82)	73 (18.35)
6,800-11,599	50 (12.56)	42 (10.55)	49 (12.32)
11,600-34,999	22 (5.52)	16 (4.02)	17 (4.27)
35,000-84,999	2 (.50)	3 (.75)	4 (1)
> of 85,000	0 (0)	3 (.75)	1 (.25)
Frequency of tobacco consumption			
Never	108 (27.14)	91 (22.86)	110 (27.63)
Sometimes	26 (6.54)	17 (4.27)	28 (7.03)
Almost always	5 (1.25)	7 (1.75)	6 (1.50)
Last month alcohol consumption			
Yes	77 (19.35)	61 (15.33)	66 (16.59)
No	62 (15.57)	54 (13.56)	78 (19.60)

Note. Own elaboration. Frequency= Freq.

The results of the depression scale showed that 69.90% of the sample fell into a classification of the absence of symptoms, 22.62% were classified as having the presence of symptoms, and 7.78% obtained scores of a clinical picture of depression.

Regarding the sociodemographic variables of the total of women, 29% had indicators of the presence of symptoms and clinical symptoms of depression, and 35% of the men. Likewise, regarding the level of study, analyzing the total number of high school students, 31% had symptoms or clinical symptoms of depression, and undergraduate students had 25%. The detailed analysis of frequencies and percentages can be seen in Table 2.

Table 2. Frequency and percentage of sociodemographic variables based on the qualitative classification of Depression.

	Absence	Presence of clinical symptoms	clinical symptoms
	Freq. (%)	Freq. (%)	Freq. (%)
Sex			
Women	221 (55.52)	68 (17.08)	23 (5.77)
Man	56 (14.07)	22 (5.52)	8 (2.01)
Completed schooling			
High School	247 (62.07)	84 (21.11)	29 (7.28)
Bachelor/Engineering	24 (6.04)	6 (1.50)	2 (.50)
Maester	3 (.75)	0 (0)	0 (0)
PhD/ Doctorate	3 (.75)	0 (0)	0 (0)
Marital status			
Single	251 (63.07)	84 (21.10)	29 (7.29)

Married	16 (4.02)	1 (.25)	1 (.25)
Divorced	2 (.50)	1 (.25)	1 (.25)
Free union	8 (2.02)	4 (1)	0 (0)
Monthly income			
< of 6,800	119 (29.90)	51 (12.81)	19 (4.78)
6,800-11,599	100 (25.13)	30 (7.54)	11 (2.76)
11,600-34,999	46 (11.55)	9 (2.26)	0 (0)
35,000-84,999	8 (2.02)	0 (0)	1 (.25)
> of 85,000	4 (1)	0 (0)	0 (0)
Frequency of tobacco consumption			
Never	219 (55.02)	67 (16.83)	23 (5.78)
Sometimes	49 (12.31)	17 (4.27)	5 (1.25)
Almost always	9 (2.26)	6 (1.50)	3 (.75)
Last month alcohol consumption			
Yes	139 (34.93)	51 (12.81)	14 (3.51)
No	138 (34.68)	39 (9.80)	17 (4.27)

Note. Own elaboration. Frequency= Freq.

Subsequently, the correlations between the sociodemographic variables of the study and the total score of the HADS scale were analyzed, finding that only age was significantly and negatively correlated with anxiety ( $r = -.206$ ;  $p < .01$ ) and depression ( $r = -.116$ ;  $p < .05$ ); Correlations with the same negative direction were identified with the completed schooling variable (anxiety  $r = -.117$ ;  $p < .05$  and depression  $r = -.126$ ;  $p < .05$ ). In the case of anxiety only, the sex variable reported negative significance ( $r = -.117$ ;  $p < .05$ ) and in the case of depression the monthly income variable ( $r = -.210$ ;  $p < .01$ ). The results are detailed in Table 3.

Table 3. Spearman correlations between sociodemographic variables and anxiety and depression

Sociodemographic variables	Anxiety	Depression
Age	-.206**	-.116*
Sex	-.117*	.009
Completed schooling	-.174**	-.126*
Marital status	.028	-.030
Monthly income	-.040	-.210**
Frequency of tobacco consumption	.008	.072
Last month alcohol consumption	.071	.037

Note. \*  $p < .05$ ; \*\*  $p < .01$ . Own elaboration.

Finally, multiple linear regressions were carried out with a stepwise method to find which sociodemographic variables of age, sex, completed schooling, marital status, monthly income, frequency of cigarette consumption, and alcohol consumption in the last month, considered as the independent variables, best predicted the presence of anxiety and depression in the sample studied, understood as dependent variables. Based on the results presented in Table 4, anxiety regression model explains 6.1% and the depression regression model 4.9% of the total variance, so the effect sizes are small (Domínguez, 2018).

Table 4. Linear regression models for anxiety and depression

Model	r	R <sup>2</sup>	R <sup>2</sup> adjust	Stand err.
Anxiety	.260	.068	.061	.012
Depression	.231	.053	.049	3.129
	DW	f	Sig.	
Anxiety	1.848	9.556	.000	
Depression	.747	11.119	.000	

Note. Own elaboration.  $R$ = regression coefficients.  $R^2$ =model fit quality.  $R^2$  adjust =  $R^2$  adjusted. Stand err. = standard error. DW= Durbin-Watson.  $f$ = overall significance of the regression model. Sig= Significance.

In the anxiety model, it was made up of the variables of age ( $\beta = -.241$ ), sex ( $\beta = -.128$ ) and marital status ( $\beta = .116$ ). Table 5 shows the standardized, non-standardized and statistical collinearity coefficients of the model.

Table 5. Multiple linear regression model for anxiety

Model	Unstand. Coeff.	Stand. Coeff.	t
	B	S.D. Error	Beta ( $\beta$ )
(Constant)	13.30	.941	14.134
Age	-.167	.035	-.241
Sex	-	.482	-.128
	1.259		
Marital status	-.646	.286	.116
	Sig.	Collinearity statistics	
(Constant)		Tol.	VIF
Age	.000		
Sex	.000	.904	1.106
Marital status	.009	.987	1.013
	.024	.894	1.119

Note. Dependent variable: anxiety. Unstand. Coeff. = Unstandardized coefficients. = Standardized coefficients Anxiety.  $B$  = slope of the regression line. S.D. Error= Standard Deviation of Error. Tol. = Tolerance, VIF= Variance Inflation Factor. Own elaboration.

The depression model was made up of only two variables: monthly family income ( $\beta = -.734$ ) and completed schooling ( $\beta = -.772$ ). Table 6 presents the standardized, unstandardized and collinearity statistical coefficients of the model.

Table 6. Multiple linear regression model for depression

Model	Unstand. Coeff.	Stand. Coeff.	t
	B	S.D. Error	Beta ( $\beta$ )
(Constant)	9.628	1.225	7.862
Monthly income	-.734	.186	-.195
Completed schooling	-.772	.391	-.098

	Sig.	Collinearity statistics	
		Tol.	VIF
(Constant)	.000		
Monthly income	.000	.978	1.022
Completed schooling	.049	.978	1.022

Note. Dependent variable: Unstand. Coeff. = Unstandardized coefficients. = Standardized coefficients

Anxiety. *B* = slope of the regression line. S.D. Error= Standard Deviation of Error. Tol. = Tolerance, VIF= Variance Inflation Factor. Own elaboration.

## CONCLUSIONS AND DISCUSSION

In the present study, a high prevalence of clinical symptoms of anxiety and depression was identified among university students, a finding that is consistent with the warning issued by the World Health Organization (2022) regarding the alarming deterioration in the mental health of adolescents and young adults during and after the COVID-19 pandemic. Notably, the levels of anxiety symptoms found in this study (over 65% of the sample) exceeded those reported in previous studies, such as those by Akhtar et al. (2020) and Vinaccia and Ortega (2020), who found rates of 24% and 55%, respectively, in university populations. This considerable increase may indicate a cumulative effect of post-pandemic stressors and academic, social, and economic pressures exacerbated in the context studied.

Regarding depressive symptoms, approximately 30% of participants reported experiencing significant depressive symptomatology, a result consistent with the findings of Vinaccia and Ortega (2020), who reported depression rates exceeding 32% in Colombian university students. These findings align with the WHO's (2022) assertion that depression remains one of the leading causes of disability globally, particularly in young populations.

Concerning sex differences, the study corroborated previous research (Chacón et al., 2021; Monterrosa-Castro et al., 2021; Zuñiga & Soto, 2021), demonstrating that female students reported higher levels of both anxiety and depression compared to their male counterparts. This trend could be attributed not only to biological and psychosocial factors but also to gender norms that may facilitate greater emotional expression among women or exacerbate vulnerability to stressors in sociocultural contexts that place greater emotional, and caregiving demands on them.

Significant correlations were also identified between sociodemographic variables and mental health outcomes. Specifically, age and education level were associated with anxiety and depression scores; sex was related to anxiety levels, and monthly family income showed a significant correlation with depression scores. These findings echo previous studies that have emphasized the role of sociodemographic factors as significant determinants of mental health in university students

(Saravia-Bartra et al., 2020; Chacón et al., 2021; Monterrosa-Castro et al., 2021; Zuñiga & Soto, 2021).

Interestingly, contrary to expectations based on prior literature (Trochez et al., 2020; Leonangeli et al., 2022), no significant correlations were found between recent cigarette or alcohol consumption and symptoms of anxiety or depression. Several explanations are plausible: first, the study did not differentiate between casual and problematic substance use, limiting a more nuanced interpretation; second, the normalization of these behaviors within university culture may reduce their direct association with psychopathology, suggesting a shift in the behavioral health dynamic among young adults.

Predictive models were constructed, albeit with small effect sizes, suggesting that younger age, female sex, and being single increased the likelihood of anxiety symptoms. Similarly, lower educational attainment and lower family income were predictive of depressive symptoms. These results highlight the need for deeper investigations into how structural socioeconomic variables—such as financial insecurity and limited educational advancement—contribute to emotional vulnerability. It is imperative to explore the influence of capitalist and consumerist cultural models, which may heighten psychological distress through mechanisms of social comparison, material insecurity, and future uncertainty.

Among this study's limitations, the voluntary and non-probabilistic nature of the sample stands out, reducing the possibility of generalizing the findings to the broader university population. The study's scope could also be enriched by including a broader range of psychological, academic, and family variables, which might yield stronger predictive models with greater explanatory power.

Nevertheless, the study makes important contributions. It provides updated information on the prevalence of anxiety and depression symptoms among university students in Coahuila, northern Mexico—a region and socioeconomic context that remains underrepresented in global and regional mental health research (Akhtar et al., 2020). Moreover, by incorporating sociodemographic factors into the analysis, the study offers a more contextualized and nuanced understanding of these mental health conditions, addressing gaps identified by Cheung et al. (2020).

Finally, the results underline the urgent need for universities to implement evidence-based psychological support programs tailored to their student bodies' characteristics and specific needs. Emotional well-being is critical not only for academic success but also for young adults' long-term personal, social, and professional development. In this sense, strengthening institutional mental health initiatives could be a preventive measure against more severe psychopathologies and contribute to a more resilient and capable future workforce (Cheung et al., 2020; Ribero et al., 2020).

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