ORIGINAL ARTICLE

Relationship between academic stress and anxiety in Mexican university students

Relación entre estrés académico y ansiedad en estudiantes universitarios mexicanos

Relação entre stress académico e ansiedade em estudantes universitários mexicanos

Rosa López Herrera [1] iD, Fernanda Linares Gutiérrez [1] iD,
Roció Pérez Guerrero [1] iD, Brayanth Gaona Escobar [1] iD,
María Eugenia Cervera Baas [1a] iD

[1] Escuela de Enfermería María Josefa Medina de Valle Arizpe, Saltillo, México.
[a] **Corresponding Author:** mariacerverabaas@gmail.com ✉

ABSTRACT
Introduction: According to the World Health Organization, academic stress and anxiety are significant public health concerns. University students face numerous stressors and challenges within educational settings, besides potential external factors. This situation can make academic stress-induced anxiety progress into a chronic condition, negatively impacting physical and mental health and increasing the prevalence and risk of anxiety disorders. **Objective:** To determine the relationship between academic stress and anxiety in Mexican university students. **Methodology:** This quantitative, correlational, cross-sectional study employed convenience sampling. A total of 102 students from three faculties in Saltillo, Coahuila, Mexico, were surveyed. The instruments used included the Systemic-Cognitivist Inventory of Academic Stress, with a Cronbach's alpha of 0.940, and the Beck Anxiety Inventory, with a Cronbach's alpha of 0.929. Data analysis was conducted using SPSS version 23, employing descriptive and inferential statistics. **Results:** The sample comprised 102 students, primarily women aged 18 to 23, with an average age of 21. A significant relationship was identified between academic stress and anxiety ($p = 0.001$, $R = 0.591$). Conclusion: This analysis highlights how academic stress serves as a triggering or exacerbating factor for anxiety. The findings underscore the importance of implementing prevention and psychological support strategies and developing effective interventions to promote the mental health of students.

RESUMEN

Introducción: Según la Organización Mundial de la Salud el estrés académico y la ansiedad representan un problema de salud pública. Los estudiantes universitarios enfrentan múltiples factores y desafíos estresantes en el entorno educativo, además de posibles estímulos externos. Esta situación puede provocar que la ansiedad derivada del estrés académico evolucione hacia un estado crónico, con efectos negativos para la salud física y psicológica, aumentando así su prevalencia y el riesgo de padecer trastornos de ansiedad. **Objetivo:** Determinar la relación del estrés académico con ansiedad en estudiantes universitarios mexicanos. **Metodología:** Es de tipo cuantitativo, correlacional y transversal. Muestreo no probabilístico a conveniencia, se encuesto a 102 participantes de 3 facultades de la ciudad de Saltillo Coahuila México. Se utiliza los instrumentos del inventario sistémico cognoscitivista del Estrés Académico con un alfa de Cronbach de 0,940 y el Inventario de ansiedad de Beck con un alfa de Cronbach 0,929. Se utiliza el programa SPSS versión 23, se analizaron los datos con estadística descriptiva e inferencial. **Resultados:** La muestra estuvo conformada por 102 alumnos de las cuales en su mayoría fueron mujeres entre 18 a 23 años con un promedio de 21 años, se encuentra una relación entre el estrés académico y la ansiedad (p= 0.001, R= 0,591)**. Conclusión:** Este análisis permite identificar cómo el estrés académico actúa como un factor desencadenante o agravante de la ansiedad, lo que subraya la necesidad de implementar estrategias de prevención y apoyo psicológico, así como también desarrollar intervenciones efectivas que promuevan la salud mental de los estudiantes.

Palabras clave: Estrés Psicológico; Ansiedad; Salud Mental; Estudiantes; Enfermería.

RESUMO

Introdução: De acordo com a Organização Mundial da Saúde, o estresse acadêmico e a ansiedade representam um problema de saúde pública. Os estudantes universitários enfrentam vários fatores de estresse e desafios no ambiente educacional, além de possíveis estímulos externos. Essa situação pode levar a ansiedade resultante do estresse acadêmico a evoluir para um estado crônico, com efeitos negativos sobre a saúde física e psicológica, aumentando assim sua prevalência e o risco de transtornos de ansiedade. **Objetivo:** Determinar a relação entre estresse acadêmico e ansiedade em estudantes universitários mexicanos. **Metodologia:** é quantitativa, correlacional e transversal. Amostragem de conveniência não probabilística, 102 participantes foram pesquisados em 3 faculdades na cidade de Saltillo, Coahuila, México. Os instrumentos usados foram o Inventário de Estresse Acadêmico Cognitivo Sistêmico com um alfa de Cronbach de 0,940 e o Inventário de Ansiedade de Beck com um alfa de Cronbach de 0,929. Foi utilizado o SPSS versão 23 e os dados foram analisados por meio de estatísticas descritivas e inferenciais. Resultados: A amostra foi composta por 102 alunos, a maioria mulheres entre 18 e 23 anos, com idade média de 21 anos. Foi encontrada uma relação entre estresse acadêmico e ansiedade (p= 0,001, R= 0,591). **Conclusão:** Essa análise nos permite identificar como o estresse acadêmico atua como um fator desencadeante ou agravante da ansiedade, o que ressalta a necessidade de implementar estratégias de prevenção e apoio psicológico, bem como de desenvolver intervenções eficazes que promovam a saúde mental dos alunos.

Palavras-chave: Estresse Psicológico; Ansiedade; Saúde Mental; Estudantes; Enfermagem.

INTRODUCTION

The World Health Organization (WHO) defines stress as a set of physiological responses that prepare the body for action, being an essential biological alert system for survival. This involves physiological, emotional, cognitive, and behavioral activation in response to various stimuli, requiring continuous adaptation to manage their consequences. Academic demands are included within these stimuli.[1]

Academic stress is one of the most common health issues today, as students must navigate the demands and challenges of an educational environment that requires significant physical and psychological resources. The cognitive and emotional strain caused by these stressors can be considerable.[1-2]

Anxiety, on the other hand, is a natural emotional response to real or perceived threats.[3] However, when excessive and prolonged, it can lead to physical and psychological changes that impair daily functioning.[4]

A study conducted at Universidad Nacional Autónoma de México (UNAM) found that approximately 60% of university students in Mexico experience stress. Globally, nearly 450 million people suffer from mental disorders. In Latin America, Brazil has the highest prevalence of anxiety disorders. Thus, understanding the impact of academic stress and anxiety on students' mental and physical health is essential.[5-6]

Given these concerns, the United Nations' Sustainable Development Goals (SDGs) emphasize a collective effort to address global challenges and promote a more just and equitable society for all. One of these goals, SDG 3, aims to "ensure healthy lives and promote well-being for all at all ages." This objective highlights the need to address and guarantee universal access to healthcare and mental health services, particularly for issues like academic stress and anxiety.[7]

With this in mind, our research question is: What is the relationship between academic stress and anxiety in Mexican university students? This question leads to the study's main objective: to determine the connection between academic stress and anxiety among Mexican students.

METHODOLOGY

This was a quantitative, descriptive, correlational, and cross-sectional study, examining the relationship between academic stress and anxiety in university students.[8]

The study was conducted at the Faculty of Physical-Mathematical Sciences, the Faculty of Marketing, and the Faculty of Science, Education, and Humanities at a public university in Saltillo, Coahuila, Mexico. A convenience sample of 102 students from these faculties was selected.

The inclusion criteria consisted of university students of legal age, of any gender, who owned a mobile device with internet access and voluntarily agreed to participate in the study. The exclusion criteria included students diagnosed with anxiety, those receiving psychiatric care, and those undergoing treatment.

A sociodemographic questionnaire was administered, collecting information on gender, age, marital status, number of children, semester, faculty, employment status, place of origin, and the last exam they took.

Regarding measurement instruments, academic stress was assessed using the Systemic Cognitivist Inventory for the Study of Academic Stress (SISCO), developed by Barraza in 2007. This inventory consists of 31 items structured as follows: a filter item (yes/no) to determine if the respondent qualifies to complete the inventory, an item rated on a five-point Likert scale (from 1 = low to 5 = high) to

measure the intensity of academic stress, and eight items rated on a five-category Likert scale (never, rarely, sometimes, almost always, always). The instrument has shown high reliability, with a Cronbach's alpha of 0.91.[9]

The Beck Anxiety Inventory was used to measure levels of anxiety. This self-administered instrument was originally developed by Beck et al. and consists of 21 items rated on a Likert scale that includes the options 0 (not at all), 1 (slightly), 2 (moderately), and 3 (severely). It assesses the severity of emotional, physiological, and cognitive anxiety symptoms and has been proven to have acceptable internal consistency ($\alpha = 0.83$ to 0.90). The instrument classifies anxiety levels based on the following cut-off scores: 0–5 (minimal), 6–15 (mild), 16–30 (moderate), and 31–63 (severe). For statistical analysis, total scores ranged from a minimum of 0 to a maximum of 63 points.[10]

Regarding data collection, prior authorization was requested from the directors of the aforementioned faculties to administer the academic stress and anxiety questionnaires.

Once the necessary permissions were granted by each faculty, the study proceeded according to the inclusion criteria. Authorization was requested to enter classrooms, where students were invited to voluntarily participate in the study. Participants signed an informed consent form and then accessed the SISCO and Beck questionnaires virtually using a QR code. The questionnaires were administered through Google Forms™, allowing participants to complete them digitally. The estimated completion time for the questionnaires was approximately 8 to 10 minutes. Additionally, participants were informed that all data collected would be handled privately, anonymously, and confidentially.

The data were processed using the Statistical Package for the Social Sciences (SPSS) version 23 for Windows. Descriptive statistics were obtained for categorical variables, while measures of central tendency and dispersion were calculated for numerical or continuous variables. To determine the use of inferential non-parametric statistics, Pearson's correlation was applied ($p < 0.05$).

This research was conducted following the provisions of *Reglamento de la Ley General de Salud en Materia de Investigación para la Salud* (General Health Law Regulations on Health Research). Ethical considerations were adhered to, ensuring the dignity and well-being of participants. Specifically, the study followed Title II, "Ethical Aspects of Research in Human Beings," Chapter I, and Articles 13, 14, 16, 17, and 20.

RESULTS

A total of 102 students from the faculties of Science, Education and Humanities, Marketing, and Physical-Mathematical Sciences were surveyed. The gender distribution shows that 49% (n = 56) were women. Regarding marital status, 34% (n = 39) of the students were single, and 33% (n = 37) belonged to the Faculty of Physical-Mathematical Sciences. The minimum recorded age was 18 years and the maximum was 26 years, with an average age of 21 years. As for the semesters attended, 16% (n = 18) were in the sixth semester of their career, and 34% (n = 39) were in the eighth semester.

Concerning health, 34% (n = 39) reported having been ill in the past week. As for the date of their last exam, 13% (n = 15) mentioned that it was six months ago, while 21% (n = 24) had taken their last exam seven days ago (see Table 1).

Table 1. Sociodemographic characteristics of university students.

Characteristics	Fr	%
Marital Status		
Single	88	86,3
Married	7	6,9
Common-law union	7	6,9
Sex		
Female	56	54,9
Male	45	44,1
Prefer not to say	1	1,0
Children		
Yes	17	16,7
No	85	83,3
Semester		
Second	8	7,8
Third	3	2,9
Fourth	18	17,6
Fifth	8	7,8
Sixth	18	17,6
Seventh	8	7,8
Eighth	39	38,2
Do you work?		
Yes	45	44,1
No	57	55,9
Have you been sick?		
Yes	39	38,2
No	63	61,8
Last exam		
6 months ago	15	14,7
2 weeks ago	24	23,5
7 days ago	24	23,5
Currently taking exams	39	38,2
Faculty		
Sciences, Education and Humanities	34	33,3
Marketing	31	30,4
Physical and Mathematical Sciences	37	36,3

Source: Author's own elaboration.

Academic Stress Levels

According to the academic stress level scale, 34% (n = 35) selected level 3 as the most relevant. On the other hand, 28.1% (n = 32) reported rarely experiencing overload due to daily tasks and schoolwork. Additionally, 27% (n = 27) responded they sometimes consider that the level of demands from professors has an impact on their stress levels, and 10% (n = 12) answered "Almost Always" regarding feelings of depression and sadness. As for anxiety, distress, and despair, 26% (n = 26) answered they rarely feel affected. Finally, 23% (n = 24) of students sometimes experience concentration problems (see Table 2).

Table 2. Levels of Academic Stress.

Question	Never		Almost never		Rarely		Sometimes		Almost always		Always	
	Fr	%	Fr	%	Fr	%	Fr	%	Fr	%	Fr	%
Having limited time to complete the work assigned by my professors.	12	10,5	21	18,4	24	21,1	17	14,9	16	14,0	12	10,5
The overload of tasks and schoolwork I have to complete every day.	13	11,4	11	9,6	32	28,1	20	17,5	21	18,4	5	4,4
The professors' personality and character.	14	12,3	26	22,8	18	15,8	22	19,3	13	11,4	9	7,9
The evaluation methods used by my professors (through essays, research papers, internet searches, etc.).	8	7,0	23	20,2	22	19,3	30	26,3	8	7,0	11	9,6
The level of demand from my professors.	9	7,9	19	16,7	25	21,9	27	23,7	10	8,8	12	10,5
The type of work assigned by my professors (topic research, worksheets, essays, concept maps, etc.).	11	9,6	17	14,9	31	27,2	23	20,2	11	9,6	9	7,9
The lack of clarity regarding what my professors expect.	17	14,9	20	17,5	21	18,4	22	19,3	10	8,8	12	10.5
Chronic fatigue (persistent tiredness).	22	19,3	21	18,4	19	16,7	21	18,4	13	11,4	6	5,3
Feelings of depression and sadness (feeling low).	11	9,6	19	16,7	30	26,3	24	21,1	12	10,5	6	5,3
Anxiety, distress, or despair.	16	14,0	15	13,2	26	22,8	25	21,9	12	10,5	8	7,0
Difficulty concentrating.	14	12,3	22	19,3	20	17,5	24	21,1	11	9,6	11	9,6
Feelings of aggression or increased irritability.	33	28,9	22	19,3	18	15,8	11	9,6	11	9,6	7	6,1
Conflicts or a tendency to argue or debate.	23	20,2	31	27,2	17	14,9	15	13,2	10	8,8	6	5,3
Lack of motivation to complete school tasks.	19	16,7	24	21,1	22	19,3	14	12,3	11	9,6	12	10,6
Focusing on solving the situation that worries me.	13	11,4	12	10,5	41	36,0	18	15,8	11	9,6	7	6,1
Establishing concrete solutions to resolve the situation that worries me.	7	6,1	20	17,5	31	27,2	22	19,3	14	12,3	8	7,0
Analyzing the pros and cons of possible solutions to the situation that worries me.	9	7,9	23	20,2	32	28,1	16	14,0	16	14,0	6	5,3
Controlling my emotions so that stress does not affect me.	10	8,8	23	20,2	28	24,6	18	15,8	18	15,8	6	4,4
Recalling similar past situations and thinking about how I resolved them.	13	11,4	17	14,9	33	28,9	10	8,8	18	15,8	11	9,6
Developing a plan to face what stresses me and carrying out tasks outlined in it.	11	9,6	23	20,2	27	23,7	16	14,0	16	14,0	9	7,9
Focusing on or trying to find the positive aspects of the situation that worries me.	11	9,6	23	20,2	26	22,8	23	20,2	9	7,9	10	8,8

Source: Author's own elaboration.

Anxiety Levels

It was found that 8% (n = 8) of the sample experienced severe hot flashes, while 25% (n = 25) reported moderate symptoms of leg weakness and tremors. The inability to relax is also manifested moderately in 36% (n = 37) of the participants, making it the most prevalent criterion.

Concerning palpitations or an accelerated heart rate, 26% (n = 26) did not experience this symptom, and 33% (n = 34) reported it as mild. Similarly, 37% (n = 38) did not experience shortness of breath. Notably, 61% (n = 62) of the students did not report experiencing indigestion or abdominal discomfort (see Table 3).

Relationship between Academic Stress and Anxiety

Pearson's correlation coefficient was used on the total score of both variables to address the general objective of this study. This revealed a significant relationship between academic stress and anxiety ($p = 0.001$, $r = 0.591$), indicating that higher academic stress is associated with higher anxiety levels among Mexican university students.

DISCUSSION

One hundred and two students from the target population were surveyed, gathering sociodemographic data including age, gender, academic semester, marital status, parental status, faculty affiliation, and employment status. The majority of the respondents were women, single, childless, and belonging to the Faculty of Physical and Mathematical Sciences, with an average age of 21 years. The highest participation came from students in their sixth and eighth semesters. These findings align with those of several studies that report that the majority of participants were women aged 18 to 20, single, without children, and primarily focused on their studies.[11,12] In contrast, the results differ from those of Acasiete and Marcatoma, who found that students were generally aged 21 to 23, mostly male, with a significant percentage studying and working at the same time, and mostly in their fifth semester. This discrepancy may stem from population growth patterns in Mexico (INEGI), which show a greater proportion of women in the 20 to 24 age group.[13]

A high level of academic stress was observed among the participants, along with significant task overload and feelings of anxiety, distress, and helplessness, which negatively impacted their concentration. As a result, many exhibited elevated levels of academic stress. This finding is consistent with studies from universities in Argentina and Mexico. In Argentina, the results show that 85% (n=139) of students report moderate academic stress, 11% (n=17) mild stress, and 4% (n=7) severe stress.[14] In contrast, in Mexico, third- and fourth-year psychology students reported moderate levels of academic stress overall.[15]

Results from the Beck Anxiety Inventory showed that 82.4% of university students experienced severe anxiety, and 17.6% had moderate anxiety. These findings are consistent with those from medical students in Lima, Peru, where 85.46% reported some level of anxiety.[16] However, they differ from another study in the same country, which showed fewer students experienced severe anxiety. This variation may be due to the university years being a period of personal and professional development, where students take on new responsibilities and face increased psychosocial pressures, making them more susceptible to anxiety. In the previously mentioned study in Peru, 55.6% of psychology students at a private university in Lima reported moderate anxiety levels.[17]

When compared to previous studies, the findings of this research strengthen the significant relationship between academic stress and anxiety in university students. For example, Celis, J. et al. in Lima, Peru, found a similar correlation between academic stress and anxiety ($r=0.33$, $p<0.001$).[18] Similarly, Jones et al. in the United Kingdom reported a significant positive correlation between academic stress and anxiety ($r=0.56$, $p<0.001$) in a diverse sample of university students.[19] These

studies, along with the results from this research (p=0.001, r=0.591), reveal that addressing academic stress is a critical factor for student well-being, emphasizing the need for effective interventions to mitigate its negative effects.

Table 3. Anxiety levels (n = 102).

Item	Never		Slightly, no significant discomfort		Moderately, very unpleasant but tolerable		Severely, almost unbearable	
	Fr	%	Fr	%	Fr	%	Fr	%
Numbness, tingling	39	34,2	30	26,3	26	22,8	7	6,1
Hot flashes	40	35,1	33	28,9	21	18,4	8	7,0
Leg weakness and tremors	38	33,3	28	24,6	25	21,9	11	9,6
Unable to relax	16	14,0	27	23,7	37	32,5	22	19,3
Fear of the worst happening	15	13,2	38	33,3	26	22,8	23	20,2
Dizziness	28	24,6	43	37,7	22	19,3	9	7,9
Palpitations or increased heart rate	26	22,8	34	29,8	26	22,8	16	14,0
Lack of balance	48	42,1	33	28,9	14	12,3	7	6,1
Terror	35	30,7	39	34,2	19	16,7	9	7,9
Nervousness	14	12,3	26	22,8	40	35,1	22	19,3
Shortness of breath	38	33,3	36	31,6	19	16,7	9	7,9
Hand tremors	29	25,4	29	25,4	30	26,3	14	12,3
Agitation	25	21,9	36	31,6	29	25,4	12	10,5
Fear of losing control	36	31,6	31	27,2	24	21,1	11	9,6
Difficulty breathing	40	35,1	33	28,9	22	19,3	7	6,1
Fear of death	51	44,7	28	24,6	18	15,8	5	4,4
Fearful	27	23,7	39	34,2	26	22,8	10	8,8
Indigestion or abdominal discomfort	62	54,4	29	25,4	7	6,1	4	35
Fainting	47	41,2	32	28,1	18	15,8	5	4,4
Facial flushing	30	26,3	35	30,7	25	21,9	12	10,5
Sweating (not due to heat)	49	43,0	32	28,1	13	11,4	8	7,0

Source: Author's own elaboration.

It is important to note that the sample used in this study was small and intentionally chosen, which limits the generalizability of the findings to the broader population or the entire student body.

CONCLUSION

A higher participation from women, with an average age of 21, was observed throughout this research. Additionally, the results show a significant relationship between academic stress and anxiety among Mexican university students.

It is recommended to implement interventions and workshops that incorporate relaxation techniques and time management strategies. These tools can assist students in effectively organizing their schedules, setting priorities, and managing their academic workload, thereby contributing to a reduction in academic stress and anxiety levels.

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AUTORSHIP:
RLH: Conceptualization, Investigation, Methodology, Writing – Original Draft Preparation, Writing – Review & Editing.
FLG: Investigation, Project Administration, Visualization, Writing – Original Draft Preparation, Writing – Review & Editing.
RPG: Formal Analysis, Resources, Software, Writing – Original Draft Preparation, Writing – Review & Editing.
BGE: Data Curation, Writing – Original Draft Preparation, Writing – Review & Editing.
MCB: Project Administration, Writing – Original Draft Preparation, Writing – Review & Editing.

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