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RESEARCH

Stress and anxiety in students of specialized nursing courses in Culiacán, Sinaloa, Mexico

Estrés y ansiedad en estudiantes de cursos especializados de enfermería, en Culiacán, Sinaloa, México

Estresse e ansiedade em estudantes de cursos especializados de enfermagem em Culiacán, Sinaloa, México

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Abstract

Introduction: Disorders affecting mental health are considered a public health problem. During their education, one out of four students experience academic stress. Furthermore, anxiety is one of the main mental disorders that generates loss of years in life due to disability, since it could prevent the acquisition and development of academic skills in students. **Objective:** Determine the relationship between the level of academic stress and anxiety in students of specialized nursing courses. **Methodology:** Descriptive correlational study, with non-probabilistic census sampling on a sample of 69 students, including nurses enrolled in specialized courses, excluding those who were not present during the interview. The information was collected through a sociodemographic chart, stress assessment scale in nursing students and Beck's anxiety inventory. Data were analyzed with descriptive statistics through frequencies, percentages, measures of central tendency and dispersion and non-parametric inferential Kruskal-Wallis, U Mant-Whiney, Chi square, Kendall's Tau b and Spearman correlation. The study complied with provisions set forth by Mexico General Health Law. **Results:** 50.7% students showed moderate stress, and 71.0% moderate anxiety. A significant statistical association was found between stress according to specialization courses, stressors, type of student and anxiety with stressor factors. The association of stress with anxiety showed a positive and significant moderate statistical correlation. **Conclusion:** Levels of stress and anxiety were higher than international reports; statistical association between stress and anxiety was demonstrated.

Key words: Stress; Anxiety; Nursing specialties; Nursing students (DeCS).

Resumen

Introducción: Los trastornos que afectan la salud mental son considerados un problema de salud pública; uno de cada cuatro estudiantes sufre de estrés académico durante su formación. Además, la ansiedad es uno de los principales trastornos mentales que genera pérdida de años de vida por discapacidad, ya que podría impedir la adquisición y desarrollo de competencias académicas en estudiantes. **Objetivo:** Determinar la relación entre el nivel de estrés académico y la ansiedad en estudiantes de cursos especializados de enfermería. **Metodología:** Estudio descriptivo correlacional, con muestreo no probabilístico censal en muestra de 69 estudiantes, incluyendo a enfermeros inscritos en cursos especializados, se excluyó quienes no estuvieron presentes durante la entrevista. La información se recolectó mediante cédula sociodemográfica, escala de evaluación de estrés en estudiantes de enfermería e inventario de ansiedad de Beck. Los datos se analizaron con estadística descriptiva a través de frecuencias, porcentajes, medidas de tendencia central y dispersión e inferencial no paramétricas Kruskal-Wallis, U Mant-Whiney, Ji cuadrado, Tau b de Kendall y correlación de Spearman. El estudio se apegó a la Ley General de Salud en México. **Resultados**: El 50.7 % presentó estrés moderado, y el 71.0% ansiedad moderada. Se encontró una asociación estadística significativa del estrés según cursos de especialización, factores estresantes, tipo de estudiante y ansiedad con factores estresantes. La asociación del estrés con la ansiedad mostró correlación estadística positiva y significativa moderada. **Conclusión**: Los niveles de estrés y ansiedad fueron superiores a los reportes internacionales, se evidenció la asociación estadística entre el estrés con la ansiedad.

Palabras clave: Estrés; Ansiedad; Especialidades de Enfermería; Estudiantes de Enfermería (DeCS).

Abstrato

Introdução: Os transtornos que afetam a saúde mental são considerados um problema de saúde pública. Durante a formação, um em cada quatro alunos sofre de estresse acadêmico. Além disso, a ansiedade é um dos principais transtornos mentais que gera perda de anos de vida por incapacidade, ao podar impedir a aquisição e o desenvolvimento de competências acadêmicas nos estudantes. **Objectivo:** Determinar a relação entre o nível de stress acadêmico e a ansiedade em estudantes de cursos de especialização em enfermagem. **Metodologia**: Estudo descritivo correlacional, com amostragem censitária não probabilística em uma amostra de 69 alunos, incluindo enfermeiros matriculados em cursos especializados, excluindo aqueles que não estavam presentes durante a entrevista. As informações foram coletadas por meio de um gráfico sociodemográfico, de uma escala de avaliação de stress para estudantes de enfermagem e do Inventário de Ansiedade de Beck. Os dados foram analisados com recurso ao software estatístico SPSS. O estudo foi realizado conforme as disposições da Lei Geral da Saúde do México**. Resultados:** 50,7% apresentaram stress moderado e 71,0% ansiedade moderada. Foi encontrada uma associação estatisticamente significativa entre o stress segundo os cursos de especialização, os factores de stress, o tipo de estudante e a ansiedade com os factores de stress. A associação do stress com a ansiedade apresentou uma correlação estatística positiva e significativa moderada. **Conclusão:** Os níveis de estresse e ansiedade foram mais altos do que os relatórios internacionais; foi demonstrada uma associação estatística entre estresse e ansiedade.

Palavras-chave: Stress; Ansiedade; Especialidades de enfermagem; Estudantes de enfermagem (DeCS).

Introduction

The various definitions of stress depend on the theoretical approach from which it is intended to be addressed, since there are those who define it as the set of physiological reactions that prepare the body for action, in accordance with the World Health Organization (WHO) [(1)]. In turn, Córdova [(2)] and data reported by the American Psychological Association [(3)], mentioned that stress is an emerging disease that is increasing every year worldwide. Likewise, in Latin America, stress is a psychosocial factor considered an epidemic of modern life, and that is why the Pan American Health Organization (PAHO) [(4)] recognizes stress as one of the diseases of the present century because of the proportions it has acquired and because it has to be treated as a public health problem.

The WHO [1] and the scientific literature agree in establishing that stress has a multifactorial etiology, the result of the convergence of intrinsic components related to the capacity and resources for cognitive-behavioral coping, as well as other extrinsic characteristics presented in situations that that individuals face and which are specific to the environment. The latter constitute a phenomenon of interest and concern for social sciences and human behavior such as psychology, pedagogy and teaching, disciplines that focus part of their interest on the study of stress in education, as pointed out by Chavez and Peralta [5], who established that any circumstance that disturbs harmony and interferes with school performance is considered a source of stress and certainly, its implications affect students, with emphasis on the nursing profession due to the complexity of theoretical and practical content that they have to assimilate in a relatively short period of time with respect to the professional life they will have to lead in the future.

To face this complex academic context during nursing training, the development of specific and innovative competencies is required, in such a way that the adaptation of students to the challenges that their curriculum demands of them is affected, increasing their risk of presenting stress, physical discomfort, decreased problem-solving skills, deterioration of interpersonal relationships, inability to relate theory to reality, fatigue and cognitive exhaustion or indiscipline [6].

Although it is known that being stressed is not always negative, it is important to note that prolonged stress is closely related to multiple psychosomatic disorders and generalized anxiety disorders represent a high percentage of years lost due to disability (YLD), as well as one of the main causes of psychosocial disability, sleep disorders, depression, associated biological alterations such as high blood pressure and coronary heart disease, as established by Herrera [7] in a study on the impact of psychosocial stress on health, where these conditions increase the amount of YLD, considered the main cause of mortality worldwide, in addition to other conditions such as arteriosclerosis, osteoporosis, diabetes mellitus, immunosuppression, some types of cancer,

endocrine alterations, problems associated with learning, cognitive processes, behavioral problems, among others [7].

Stress is often associated with anxiety because it is a natural response to stressful situations. For the Spanish Society for the Study of Anxiety and Stress [8], anxiety is considered a natural adaptive mechanism that allows a person to stay in a state of alert in the face of compromising events. This alert implies survival, therefore, a certain degree of anxiety can provide relevant doses of caution in dangerous circumstances. However, anxiety can become unsustainable and disproportionate with consequences that deteriorate the biopsychosocial spheres of individuals, thus generating anxiety disorders [8].

In this respect, the Diagnostic and Statistical Manual of Mental Disorders (DSM) [9] and the American Psychiatric Association [3] indicated that generalized anxiety is frequently related to chronic environmental stress or significant vital experiences encountered in the period of one year, such as work and school activity, with a global percentage that covers 3 to 5% of adults, as demonstrated by Castillo [10] in a study conducted in Latin America, in the work the author determined that the Health Sciences students were exposed to higher levels of stress compared to their peers from other disciplines, generating in addition a sustained anxiety faced during their academic training, conforming as a serious problem that affected their academic performance and their resilience, also compromising their physical health.

In Mexico, Ruvalcaba [11] reported that predominantly moderate and severe anxiety was present and correlated at similar rates with the level of stress in male and female nursing students. Likewise, it was determined that stress and anxiety share etiology and emotional, cognitive and behavioral risk factors, so it is impossible to deny that anxiety is a prevalent condition whose incidence increases and is a cause of psychological, physical and social deterioration in nursing students [11].

In turn, in the academic context of Sinaloa, it was seen through this study that there is a considerable number of professional level students who present high levels of academic stress and anxiety in relation to theoretical-practical aspects of their professional training, influencing significantly on their academic performance. Most students find it difficult to control their worry, they present restlessness, difficulty concentrating, muscle tension, sleep problems, behavioral changes such as irritability, a constant feeling that something bad is about to happen, or intolerance of criticism from peers and teachers [(12)].

It should be noted that there are few studies in Sinaloa that show the significance of the problem of stress and anxiety in school contexts of nursing students, and more precisely, the mobility of these variables in mental health among the students of specialization courses was unknown, inserted in specific work contexts and under diverse social and contextual parameters. The specializations mentioned in this article and that formed part of the analytical matrix of the research are made up of specialized technical nursing courses in family medicine, pediatrics, and intensive care. These courses are offered to nurses who work in medical units of the Mexican Government Medical (Social) System (or IMSS), at domestic level, with the academic endorsement of the Universidad Nacional Autónoma de México (or UNAM), in order to professionalize their practice as a form of continuing education.

Due to the complexity of the aforesaid specialized training, the psychosocial and emotional load is greater, so it is necessary to determine the level of stress and anxiety that is generated among this population group who has previously experienced other intense training dynamics, but on this occasion they directly concern their professionalization in a specific field of work and with demands for specific skills. The above represents the originality of this study, because the scientific research of the students is concentrated in undergraduate or postgraduate studies, but there are few that consider professional personnel who opt for specialization, adding to their usual workload the

responsibility of specific training with greater demands and unknown challenges that must be overcome in parallel with the workload.

The purpose of this research will provide the basis for future research, allowing nursing school and college managers to design stress management prevention programs, as well as intervention programs that reduce academic stress and anxiety in students of specialized courses. The objective was to identify the sources that generate these mental health anomalies, so the following question was raised: What is the relationship that exists between the academic stress level and anxiety in students of specialized nursing courses?

Methodology

A descriptive, observational, cross-sectional and correlational study was conducted. The study population was made up of 69 students, whose selection criteria were as follows: individuals of both genders enrolled in specialized courses for pediatric nursing, intensive care and family medicine, between the ages of 18 and 50, appointed to a second level hospital in the city of Culiacan, Sinaloa, Mexico, IMSS specialized human resources training center, which annually receives students from Sinaloa and other states of Mexico. The sampling used was non-probabilistic, census-type, so all students formally enrolled in the courses were included. The 69 participants were classified into three groups: pediatrics, intensive care, and family medicine.

For the collection of data regarding social and contextual profile of the participants, a sociodemographic chart (CSD-7) was used, an instrument that consisted of collecting the variables of the course, gender, age, marital status, job seniority, local or foreign origin of students and the so-called category of foreigner. The “foreigner” category refers to students from other states of Mexico, as well as those who come from municipalities surrounding Culiacan, the capital city. The question was: What situations stress you the most?

Likewise, the stress evaluation instrument in nursing students (AEEE-19) was implemented [13], consisting of a reduced scale designed to evaluate stress in nursing students, developed by Costa, et al [13] including 19 items distributed in four domains, that is, carrying out practical activities (items 2, 3, 4, and 5), theoretical activity (items 1, 7, 9, 10, 15, 17, and 19), environment (items 8, 14, 16, and 18), and vocational training (items 6, 11, 12, and 13) [13]. The score of the instrument corresponds to a Likert-type scale, under a scale of four response categories: 0 = did not experience the situation, 1 = I do not feel stressed with the situation, 2 = I feel little stressed with the situation, 3 = I feel much stressed with the situation. The interpretation of the scale determines that the higher the score, the greater the student's stress will be [13], and the same criterion applies to the subscales. For this study, a variable transformation was carried out in order to estimate the level of stress as low, medium and high. The AEEE-19 instrument [13] showed acceptable internal consistency in previous research [13], and Riveiro, et al. [14], in Brazilian populations, where the correlation coefficient ranged between 0.71 and 0.86 Cronbach's alpha. In this study, a reliability of 0.80 was obtained.

The Beck Anxiety Inventory (BAI-21) (15), considered a useful tool to assess somatic symptoms of anxiety, in anxiety disorders as well as in depressive symptoms [15]. It includes 21 items, with a Likert-type scale where: 0 = not at all, 1 = slightly, it doesn't bother me much, 2 = moderately, it was very unpleasant, but I could bear it, 3 = severely, I could hardly bear it. The interpretation of the scale determines that as the score increases, the anxiety also increases. In addition, the scale establishes that the cut-off point is 00 to 21, corresponding to very low anxiety, 22 to 35 corresponding to moderate anxiety, and more than 36 corresponding to severe anxiety. In the Mexican population, the BAI-21 has shown acceptable internal consistency of 0.91 Cronbach's alpha, in accordance with the reports of Prados, et al. [16]. In this study, a reliability of 0.89 was obtained.

With the information previously requested from the hospital about the people enrolled in the specialization courses, the research participants were approached in their respective classrooms, explaining the purpose of the study and requesting their voluntary participation. Once the informed consent process was completed, they signed the document and the study continued. In the first instance, the participants answered the CSD-7 form, followed by the AEEE-19 and the BAI-21 instruments, in a response period of 10 to 15 minutes per participant. Finally, the present study considers three sub-variables, that is, being away from the family, the pandemic current situation, becoming infected with COVID-19, which, although they do not represent a substantial part in the analysis of the relationship of stress and anxiety with studies of specialized courses, they illustrate that there are exogenous factors that accentuated these conditions in the respondents. The results and analysis in the measurement of these variables should be considered as complementary information that contextualizes the problem and gives a holistic nature to the hostile panorama that the students experience.

The study data were quantitatively analyzed using the Statistical Package for the Social Sciences (SPSS) software, version 25.0 for iOs. Descriptive statistics made it possible to know the characteristics of people participating in the study through absolute frequencies, percentages, measures of central tendency and dispersion (average -mean, median, and standard deviation). Inferential statistics made it possible to determine the degree of relationship between the main variables objectives of the study, with the purpose of answering the objective and research question previously raised. The reliability of the AEEE-19 and BAI-21 scales was determined through Cronbach's alpha correlation coefficient. Non-parametric statistical tests were used such as H Kruskal-Wallis, U Mant-Whiney, Chi square, Kendall's Tau b, Spearman correlation [(17)].

The study adhered to the provisions of the General Health Law on Research in Mexico. The research was considered to be of minimal risk because it only look for stress and anxiety in students

enrolled in specialized courses, without intervention by the researchers. Likewise, the informed consent was signed by each participant prior to the interview. There was also an approval opinion from the Local Health and Ethics Research Committee 2506, of the IMSS, with registration number R-2021-2506-006 [18].

Results

The average age of participants was 34 years (SD= 4.6), with an average job seniority of 12.5 years (SD= 3.9), and the female gender predominated with 74.5%. Of this percentage, 34.8% were in the specialized nursing course in family medicine, 33.3% in intensive care nursing, and 31.9% in pediatric nursing. Regarding the level of stress, it was found that 50.7% of the students presented moderate stress, seconded by low stress 44.9%, while high stress occupied 4.3%. While anxiety was reported to be experienced at a medium level by 71.0%, and severe anxiety was reported by 11.6% (Table 1).

Table 1. Sociodemographic data, level of stress and anxiety in students of specialized nursing courses, 2021. (n=69)

Variables	f	%	IC 95%
Gender			
Female	52	75.4	
Male	17	24.6	
Course			
Family medicine nursing	24	34.8	
Pediatric nursing	22	31.9	
Intensive care nursing	23	33.3	
Marital status			
Single	20	42.0	
Married	49	58.0	
Job seniority			
2 to 5 years	11	15.9	
6 to 10 years	33	47.8	
11 to 15 years	15	21.7	
16 to 20 years	7	10.1	
More than 20 years	3	4.3	
Student type			
Local	45	65.2	

Foreigner	24	34.8	
Factors that are considered stressfull to you			
Being a foreign student	4	5.8	
Being away from family	36	52.2	
The current situation of the pandemic	15	21.7	
Stress level			
Low	31	44.9	0.42 - 0.45
Medium	35	50.7	0.48 - 0.52
High	3	4.3	0.3 - 0.5
Anxiety level			
Low	12	17.4	0.16 - 0.18
Medium	49	71.0	0.70 - 0.72
High	8	11.6	0.10 - 0.12

Source: Own development.
f=absolute frequency, %= percentage, IC= 95% confidence interval

When stress and anxiety were related to the specialization courses and the stressors, it was found that there is statistical evidence to verify this association ($p < .05$), since general stress showed an association around the specialization course ($H = 18.92$, $p = .01$). In this regard, the nurses enrolled in the pediatric nursing course presented higher median stress (Mdn=40.59) compared to those enrolled in the intensive care nursing course (Mdn=32.07), and family medicine nursing (Mdn= 22.10).

Stress in practical activities showed an association with the stressors, mentioned in the methodology as contextual ($H=17.69$, $p=.05$), where the students who reported being away from their families presented higher medians of stress in the internships (Mdn=25.31), followed by the variable of being infected with Covid-19 (Mdn=21.29), and being a foreign student (Mdn=19.50). Stress in theoretical activities showed an association with the course ($H=13.22$, $p=.01$), so the students enrolled in the pediatric nursing course presented higher median stress in theory (Mdn=69.01) compared to students in the intensive care nursing course (Mdn=49.13) and family medicine nursing course (Mdn=40.14).

Stress in professional training was associated with some stressors (H=15.19, p=.02), since students who reported being away from their family showed higher medians of professional stress (Mdn=39.64), abetted by the current pandemic situation (Mdn=27.68) and being a foreign student (Mdn=17.96). Finally, anxiety showed a significant association with the aforesaid stressors (H=18.73, p=.03), becoming infected with Covid-19 presented higher median anxiety in students (Mdn=43.21), followed by the current situation of the pandemic (Mdn=38.05), and being a foreign student (Mdn=37.76), (Table 2).

Table 2. Stress and anxiety, according to the specialization course and stressors, 2021. (n=69)

Variable	Stress/anxiety	n	$\bar{x}$	Mdn	SD	H	p Value
	General stress						
Specialization course	Family medicine nursing	24	20.29	22.10	19.03	18.92	.01
	Pediatric nursing	22	38.16	40.59	18.81		
	Intensive care nursing	23	30.21	32.07	14.69		
Stressors	Being a foreign student	4	19.74	21.72	11.86	1.48	.68
	Being away from family	36	31.36	33.35	21.15		
	Pandemic current situation	15	30.18	32.19	16.40		
	Getting infected with Covid-19	14	25.75	27.81	16.74		
	Stress practical activities						
Specialization course	Family medicine nursing	24	15.41	17.40	11.78	1.03	.59
	Pediatric nursing	22	26.36	28.23	25.17		
	Intensive care nursing	23	16.95	18.63	12.22		
	Being a foreign student	4	17.50	19.50	17.07		
Stressors	Being away from family	36	23.33	25.31	18.04	17.69	.05
	Pandemic current situation	15	10.66	12.70	14.37		
	Getting infected with Covid-19	14	19.28	21.29	18.59		
	Stress theoretical activities						
Specialization course	Family medicine nursing	24	39.28	40.14	26.35	13.22	.01
	Pediatric nursing	22	66.88	69.01	47.27		
	Intensive care nursing	23	47.82	49.13	32.28		
	Being a foreign student	4	30.35	32.35	26.96		
Stressors	Being away from family	36	48.80	50.88	30.23	3.45	.32
	Pandemic current situation	15	58.09	59.90	21.06		
	Getting infected with Covid-19	14	54.59	56.59	27.25		

	Environmental stress						
Specialization course	Family medicine nursing	24	24.47	26.48	39.48	2.11	.34
	Pediatric nursing	22	17.61	19.34	31.34		
	Intensive care nursing	23	20.10	22.83	33.83		
	Being a foreign student	4	28.12	30.12	21.34		
Stressors	Being away from family	36	18.40	20.41	17.54	3.36	.33
	Pandemic current situation	15	20.00	22.00	17.55		
	Getting infected with Covid-19	14	25.89	27.90	15.08		
	Professional training stress						
Specialization course	Family medicine nursing	24	26.56	27.00	22.81		
	Pediatric nursing	22	26.13	28.11	28.05		
	Intensive care nursing	23	33.15	35.76	15.81	4.37	.11
	Being a foreign student	4	15.62	17.96	11.96		
Stressors	Being away from family	36	37.50	39.64	24.64	15.19	.02
	Pandemic current situation	15	25.83	27.68	16.68		
	Getting infected with Covid-19	14	12.50	14.50	12.00		
	Anxiety						
Specialization course	Family medicine nursing	24	35.79	37.79	10.79	4.46	.10
	Pediatric nursing	22	39.09	41.09	8.50		
	Intensive care nursing	23	35.65	37.65	9.63		
	Being a foreign student	4	35.75	37.76	11.72		
Stressors	Being away from family	36	34.16	36.19	9.05	18.73	.03
	Pandemic current situation	15	38.80	38.05	7.76		
	Getting infected with Covid-19	14	41.71	43.21	11.21		

Source: Own development.
n= sample size, $\overline{X}$ =mean, Mdn=median, SD= standard deviation, H= Kuskal Wallis test, p value= margin of error.

When stress and anxiety were associated with gender, marital status, and type of local or foreign student, it was seen that only the stress in theoretical activities showed an association with being a local or foreign student (U= 370.50, p= 0.04), the rest of the sociodemographic variables did not show significant differences (p>.05) (Table 3).

In turn, as Table 4 shows, the association of stress with anxiety displayed significant differences, (X2 =10.17, p=.03). A significant fact is that just over half of the people interviewed under the

aforementioned parameters (62.5%) stated that they suffered from severe anxiety and moderate stress, unlike the measurements described above.

Table 3. Stress and anxiety according to gender, marital status and type of student, 2021 (n=69).

Variable	Stress/Anxiety	n	$\bar{X}$	Mdn	SD	U	p Value
	General stress						
Gender	Female	52	26.11	26.32	19.10	263.50	.10
	Male	17	39.01	36.84	14.71		
Marital status	Single	29	30.76	34.21	17.24	523.00	.48
	Married	40	28.22	34.21	20.11		
Student type	Local student	46	27.12	34.21	19.34	425.50	.18
	Foreign student	23	33.64	34.21	17.47		
	Stress practical activities						
Gender	Female	52	17.88	10.00	15.76	386.00	.42
	Male	17	24.11	10.00	22.65		
Marital status	Single	29	23.79	20.00	18.97	431.50	.06
	Married	40	16.25	10.00	16.28		
Student type	Local student	46	19.56	10.00	17.50	510.50	.80
	Foreign student	23	19.13	10.00	18.56		
	Stress theoretical activities						
Gender	Female	52	47.39	46.42	28.53	305.50	.06
	Male	17	61.76	64.28	23.27		
Marital status	Single	29	51.72	50.00	27.77	562.50	.83
	Married	40	50.35	57.14	28.29		
Student type	Local student	46	46.27	50.00	26.88	370.50	.04
	Foreign student	23	60.24	64.28	28.06		
	Environmental stress						
Gender	Female	52	18.50	12.50	16.13	313.50	.06
	Male	17	27.94	27.94	19.02		
Marital status	Single	29	21.98	25.00	17.24	541.00	.62
	Married	40	20.00	25.00	17.40		
Student type	Local student	46	20.10	25.00	16.97	499.00	.69
	Foreign student	23	22.28	12.50	18.05		
	Professional training stress						
Gender	Female	52	27.16	25.00	24.21	346.50	.17
	Male	17	33.08	25.00	16.50		
Marital status	Single	29	29.31	25.00	19.55	533.50	.56
	Married	40	28.12	25.00	24.79		
Student type	Local student	46	30.43	25.00	21.18	407.00	.11
	Foreign student	23	25.00	25.00	25.28		
	Anxiety						
Gender	Female	52	37.07	37.00	10.46	402.00	.57
	Male	17	35.94	35.00	7.11		
Marital status	Single	29	36.20	35.00	9.23	547.00	.68
	Married	40	37.22	37.00	10.13		

Student type	Local student	46	36.08	35.00	10.09	1491.00	.12
	Foreign student	23	38.28	39.00	8.92		

Source: Own development.
n= sample size, $\overline{X}$ =mean, Mdn=median, SD= standard deviation, H= Kuskal Wallis test, p value= margin of error.

Because low frequencies were present, less than five, the significant association was verified with Kendall's Tau-b statistical test, proving statistical significance (Tb=0.337, p=.002), (Table 4).

Table 4. Stress and anxiety level, 2021 (n=69).

Variable	Anxiety						X^2	p Value
	Low		Medium		Severe			
Stress	f	%	f	%	f	%		
Low	10	83.3	19	38.8	2	25.0	10.17	.03
Medium	2	16.7	28	57.1	5	62.5		
Low	0	0.0	2	4.1	1	12.5		
Total	12	100	49	100	8	100		

Source: Own development.
f=absolute frequency, %= percentage, X^2= Chi square test, p value= margin of error.

Table 5 depicts the moderate positive and significant correlation of anxiety with stress (rho=0.599, p=.01), showing that as stress increases in nursing students enrolled in specialized nursing courses in family medicine, pediatrics and intensive care, so does anxiety. This confirms the premise that the greater the stress, the greater the anxiety in the students. Likewise, it was noticed that there is a positive and significant statistical correlation ($p < .05$) between anxiety due to practical and theoretical activities, with the environment and professional training, which varies from low to moderate (rho=0.356 to 0.551). In this regard, when the coefficient of determination was estimated (R2 = 0.35), it was found that stress explains 35% of the anxiety of students enrolled in specialized nursing courses.

Table 5. Spearman correlation for anxiety, stress, practical and theoretical activities, environment and professional training, 2021 (n=69).

Variables	1	2	3	4	5
Anxiety	1				
General stress	0.599**	1			
Practical activities stress	0.217*	.356**	1		
Theoretical activities stress	.360**	.773**	0.573*	1	
Environmental stress	0.339*	0.347*	0.445*	0.447*	1
Professional training stress	0.236*	.558**	.519**	0.664*	0.551*

Source: Own development.
Significance *= .05, **=.01

Discussion

In this research, it was perceived that medium stress affected half of the students in specialization courses, and only a smaller number reported experiencing a high level of stress. The significant data that depict the parallel correlation between the conditions raised in this research is that, like stress, anxiety remains at a medium level among the majority of those surveyed, with a lower level of severe anxiety. According to the WHO [19], mental disorders account for just over a tenth of the global burden of disease and disability, which are reflected by educational difficulties, risk behaviors and alterations in physical and mental health.

The data obtained in the present study exceeded the WHO reports, and differed from what was reported by a Mexican author [20] who reported that almost a fifth of the students new to higher education in Nuevo Leon showed some degree of anxiety with almost two tenths of stress, data considered lower than those found in the present study. In the same way, the figures presented here partially agree with what was indicated by Peruvian researchers [21], who indicated that a little more than half of the university students interviewed showed a moderate level of stress in the stressor dimension, while a little less than half had a moderate level in the symptoms dimension.

In a study on anxiety and academic stressors in nursing students in Peru, it was found that just over three tenths of those interviewed revealed some type of anxious symptoms and a prevalence of

anxiety of almost one fifth, values lower than what was seen in the present research work. On the contrary, the research results shown above agreed in part with what was reported by a Colombian author [22] who studied academic stress in nursing students, finding that just over two-fifths showed a medium level of stress at the time of the interview. The fact that in this study a medium level of stress and anxiety was found can be explained by the insertion of the student into the academic context, where it is required to use multiple academic competencies that converge with biopsychosocial and environmental factors, favoring the occurrence of academic stress and anxiety. When this research compared general stress, practical, theoretical and professional activities, a significant statistical association was evident with the specialization course, stressors and type of student, something similar was seen in the case of the contrast between anxiety and stressors. The above is consisting with a study in Peruvian university students [23] where a significant statistical association of academic stress with the specialty of study was found. Therefore, the students enrolled in the specialties were characterized by presenting high levels of academic stress. When this academic stress was associated with gender, it was noted that females showed high and moderate levels of stress compared to males, who showed low and moderate levels.

However, in the review of the specialized literature, a partial difference was evident with the reports of various authors where one reported an association of stress and anxiety with gender, determining that the female gender presented higher percentages of stress and anxiety compared to men [20], while the other study carried out in Chile [24] noted the correlation between anxiety with academic performance and gender in nursing students, where the female gender presented higher averages of anxiety compared to the male gender. It is significant in terms of the data presented in this work and the country where the studies were carried out, that a research carried out in Guadalajara, Mexico [25] determined that the female gender manifested higher levels of anxiety and academic stress in nursing students. Studies in Mexico and the rest of Latin America showed that there is an

intrinsic association of stress and anxiety with some sociodemographic variables such as gender, course enrolled, and practice. The level of demand of some educational programs can lead students to develop stress and its consequent anxiety, however, in the present study, a direct association of anxiety with gender was not found, as was seen in the research made about Mexico and Chile [20,24,25].

Regarding the association between the level of stress and the level of anxiety, in this research it was found that there is statistical evidence to verify a significant association of the level of stress according to the level of anxiety presented, matching with what was reported by a researcher [20] whose study reported that two fifths of the students presented a direct association between the level of stress and anxiety (2.3% low, 1.3% moderate, 0.2% severe, 0.6% extremely severe). Likewise, this author [20] agreed with a Spanish researcher [26] who found a significant statistical difference between stress and anxiety in physiotherapy students. The association between stress and anxiety may be related to the fact that stress is considered a state of activation of the body in response to stimuli in daily life; however, inadequate management of the problem generates a combination of physical and mental manifestations that reveal themselves in the form of crises, such as the permanent state of anxiety.

Finally, in this research work it was found that there was a positive and significant statistical correlation of stress with anxiety, agreeing with Turkish researcher [27] whose study was to know the impact of anxiety, depression and stress on the emotional stability of university students, reporting low significant positive statistical correlation of stress with anxiety.

In turn, another research [28] on anxiety, depression, stress and self-esteem, depicted that there was a moderate significant positive statistical correlation between stress and anxiety in students, reaffirming that a higher stress level corresponds to a high anxiety index. There is evidence that stress and anxiety are significantly correlated in nursing students, specifically during the teaching

period framed by the Covid-19 pandemic in Peru [21]. The fact that there is a close correlation between stress and anxiety can be explained by the fact that both generate adaptive subsistence responses in people, likewise, both are associated with cognitive physiological processes that at certain times manifest themselves, generating loss of control of emotions, physical health problems and, in the case of students, reduced academic performance.

A consideration consistent with the analysis is that stress is the origin of some behaviors such as onychophagia, excessive worry, fatigue, irritability, insomnia, and some psychological disorders. As a result, students regularly present lack of concentration, mental blockage, depression and anxiety, obstacles that interfere with the acquisition of specialized academic skills during their professional training [29]. Stress and anxiety have also been found to interfere with the development of cognitive skills or academic performance, increasing the risk of licit and illicit drug use that seeks to improve academic performance [30].

One of the limitations of this study is that the estimates focused on establishing the strength of association of the main variables in a limited specific context, so it is convenient that in subsequent research probabilistic sampling with larger populations be used, as well as exploring the variables presented here in explanatory designs allowing for the determination of the extent to which stress predicts anxiety.

Conclusions

It was found that the students of specialized nursing courses presented a moderate level of stress and anxiety, and although it may seem like a non-alarming result due to the level of demand to which the people surveyed are exposed to, the limits reported by the WHO are exceeded, as well as the results of studies in Mexico and the rest of Latin America. When stress and anxiety were

linked to specific sociodemographic and contextual variables, an additional significant association was found with the training course that the students took.

Stressor factors such as gender and type of student were associated with stress and anxiety in a moderate positive and significant correlation, allowing us to answer the objective and research question set out in the methodology. In this way, the analysis verified the association between academic stress and anxiety among students of specialized nursing courses.

It is important to note that the presence of moderate levels of stress and anxiety represents a proper moment to establish specific academic interventions aimed at the psychological, pedagogical or emotional needs of the students of intensive courses such as those analyzed here, with the purpose of preventing the presence of high levels of stress and anxiety, thereby improving their academic performance and permanence in academic programs.

Conflict of interests

The authors declare no conflict of interest.

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