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Stress level of nursing students at the clinical practicum in the University of Aguascalientes (Mexico)

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Introduction: Coping with stress is a process that involves a particular relationship between the individual and his/her environment. Nursing students are exposed to stressful situations during their practical training, due to the responsibilities they take, which increase as they pass the semesters. The aim of this study was to identify the stress level in the clinical practicum of nursing students at the Autonomous University of Aguascalientes (UAA) (Mexico) in each semester, taking into account a series of sociodemographic variables.

Methods: This study employs a quantitative, correlational, and comparative design with a non-experimental, cross-sectional approach. The sample consisted of 190 nursing students belonging to different semesters of the clinical practicum of the UAA. The KEZKAK instrument was used to gather data.

Results: Moderate to high stress levels were reported by 70.2% of the participants, indicating a considerable prevalence of stress among the sample. With regard to the association of stress levels with each semester, it was observed that the seventh semester obtained the highest percentage of stress, with statistically significant differences ($p < 0.001$). Female students also reported higher stress levels than male students, although this difference was not statistically significant ($p = 0.428$).

Discussion: Nursing students in the clinical practicum have moderate stress levels. The clinical practicum represents a transmission of knowledge that will help students to become professionals. Therefore, in order to fulfill their main goal of providing care to others, nursing students must take care of their own health.

KEYWORDS

stress, nursing, clinical practicum, public health, nursing students

1 Introduction

The 21st century has brought countless scientific and technological advances. However, one of the variables inherent to this century is the increasing stress level that is being experienced by the population (Expósito-Duque et al., 2024). A stressful situation requires an adequate coping or adaptive response, although this is not always the case (De Dios et al., 2017). Responses to stressful situations do not always appear in the same manner, as they are influenced by personal and environmental variables (Cruz et al., 2024).

Stress is an emotional adaptive process that is necessary in certain cases, as it helps to implement mechanisms against certain situations to move forward; however, when stress persists, it may become an additional risk factor for human health (Bonfil et al., 2010). Some studies have described the concept of toxic stress, which appears when the stimulation is harmful, threatening or ambiguous (Fierro, 1998). Stress depends not only on stressful situations or environmental factors, but also on the way in which the individual copes with said situations and evaluates the magnitude of the problem. When stress is intense and persists for a long time, it can have negative consequences at the emotional, cognitive, behavioral and physiological levels (Bonfil et al., 2010).

Stressful situations may appear in people's lives through multiple scenarios. In this sense, a context that usually generates physical and emotional overload is the one related to university life, where a large number of future professionals are trained (De Dios et al., 2017). University students are exposed to academic overloads, such as exams, presentations, assignments, workshops, and research. In addition to all these variables, health science students are also exposed to the clinical practicum. When all this overload is added to the clinical practicum, the human body begins to manifest stress through physiological changes, such as an increase in heart rate, sweating, hyperventilation and general discomfort, among other changes, causing an increase in the level of stress and, in some cases, a decrease in concentration (Abarca et al., 2022).

The clinical practicum is a fundamental component for the learning of knowledge. Through the clinical practicum, students develop the competencies and skills required to carry out the techniques and procedures that are necessary for the attainment of health science degrees (Felici, 2023). Some researchers have observed that the practicum is stressful for students, especially in their first university years, affecting females more frequently (Arias et al., 2018). When students begin their academic journey in the practical training, they face a multifactor and dynamic scenario (influenced by their organization and culture) that provides numerous stress-generating stimuli, such as contact with technologies, different diseases, pain, suffering and death (Vanegas et al., 2017). In this sense, feelings of fear and frustration may appear due to the perception of lacking the necessary knowledge to provide proper care and the risk of causing some harm to the patient (Requelme-Jaramillo et al., 2023).

One of the student populations with the greatest reported stress level is that of nursing students, due to the specific characteristics of their clinical practicum (Vanegas et al., 2017). Nevertheless, this stress not only depends on the type of training practices, but it may also be related to a series of sociodemographic variables (Arntz et al., 2022). Thus, it is necessary to identify possible relationships of other variables with stress, in order to determine which skills must be strengthened and apply effective coping strategies (Ramos-Maquera, 2021).

In recent years, Positive Psychology (PP) has emerged as a relevant theoretical framework to promote well-being, resilience, and effective stress management in educational settings. PP focuses on identifying and enhancing individual strengths, fostering positive emotions, and cultivating personal growth and flourishing (Lo and Punzalan, 2025). In higher education, interventions grounded in PP, such as mindfulness exercises, gratitude journaling, and resilience training, have been shown to significantly improve mental well-being, reduce stress, and strengthen interpersonal relationships among faculty members. These strategies are highly transferable to students, particularly in high-pressure fields such as nursing, where sustained stress can affect academic performance and health outcomes. The integration of PP approaches into nursing education may therefore represent a promising avenue for both prevention and support, enhancing students' ability to cope with the demands of the clinical practicum (Lanz, 2020).

Therefore, the aim of this study was to identify the stress level in the clinical practicum of nursing students of the Autonomous University of Aguascalientes (UAA) (Mexico) in each semester, taking into account a series of sociodemographic variables.

2 Materials and methods

2.1 Participants

The sample was constituted by 190 nursing students from the University of Aguascalientes (Mexico). The study included students in their 3rd-8th semester who were undertaking the clinical practicum, excluding those who undertook two clinical practicums at the same time.

2.2 Procedure

A correlational, comparative, quantitative, non-experimental, cross-sectional study was conducted. The field work was carried out in August–December 2019. The total population consisted of 310 nursing students enrolled in clinical practicum courses at the University of Aguascalientes (Mexico). The population data were extracted from the institutional student database.

The sample was selected through a probabilistic model, considering a sampling error of 0.05. The sample size was calculated using the formula for finite populations: $n = N / [1 + N(e^2)]$, where $N = 310$ and $e = 0.05$. This yielded a required sample size of approximately 174 students. To account for potential non-responses or incomplete data, the sample size was increased to 193.

A systematic random sampling method was applied. A complete, ordered list of eligible students was obtained, and a random starting point was selected. From there, every k-th student was invited to participate. Although no stratification was performed by semester, the final sample included proportional representation across all academic years.

A data collection chronogram was planned, and different visits were conducted across semesters. In each visit, documentary questionnaires were administered to the participants, following the established random selection. The scales were completed in 30 min, with the help of one of the researchers or a collaborator to solve doubts.

The questionnaires were administered in supervised classroom settings during regular academic hours, ensuring a quiet and standardized environment for all students. Participants received both verbal and written instructions on how to complete the KEZKAK scale and were informed of the estimated time needed. To minimize response bias, data collection was carried out in the absence of faculty members, and participants were assured that their responses would remain anonymous and would not influence their academic evaluation. Completed questionnaires were returned in sealed envelopes immediately after completion.

The sociodemographic information, the semester in which the students were undertaking their clinical practicums, and the information related to stress were gathered through the KEZKAK

form (Zupiria et al., 2002). All participants signed an informed consent form, with full assurance of anonymity. Three questionnaires were excluded due to incomplete responses that made scoring on the KEZKAK scale impossible. As a result, the final analysis included 190 complete and valid cases. No imputation methods were used, and only fully completed questionnaires were considered. The study was authorized by the management team of the University and by the Research Ethics Committee of Aguascalientes (code: AEI-14-19).

2.3 Evaluation instruments

The participants completed a brief sociodemographic survey that collected information about their age, marital status, sex, previous nursing studies, and number of children. It also included academic information to identify whether the student was a repeater and the semester in which he/she was undertaking his/her clinical practicum. The stress level of the students was determined using the KEZKAK scale: "Bilingual questionnaire of stressors in nursing students during the clinical practicum" (Cronbach's alpha = 0.95) (Zupiria et al., 2002). This questionnaire consists of 62 questions distributed in 9 dimensions: (1) lack of competence (items: 1–11), (2) contact with suffering (items: 12–21), (3) relationships with faculty and peers (items: 22–27), (4) impotence and uncertainty (items: 28–38), (5) lack of control over the relationship with the patient (items: 39–46), (6) emotional involvement (items: 47–50), (7) getting hurt in the relationship with the patient (items: 51–55), (8) the patient seeks an intimate relationship (items: 56–57), (9) student overload (items: 58–62). The KEZKAK instrument is based on a Likert scale, with the following scoring system: (0) not at all, (1) a little, (2) much, and (3) a lot. To classify the stress level, the following cutoff points were considered: (0–47) not at all, (48–92) a little, (93–139) much, and (140–186) a lot (Arias et al., 2018).

2.4 Statistical analysis

The data collected were analyzed using IBM SPSS Statistics, version 25. First, a univariate analysis was conducted to describe the sociodemographic and academic characteristics of the sample. For quantitative variables (such as age and total KEZKAK score), measures of central tendency and dispersion were calculated, including mean, standard deviation, minimum, and maximum values. For categorical variables (sex, marital status, number of children, practicum semester, prior nursing education, and academic repetition), absolute frequencies and percentages were reported.

Before conducting inferential analyses, the normality of the quantitative variables was assessed using the Kolmogorov–Smirnov test, as the sample size exceeded 50 participants. The test results indicated that the data did not deviate significantly from a normal distribution for the "KEZKAK instrument total score" variable ($p = 0.053$), supporting the use of parametric tests for some of the comparisons. On the other hand, the results of the previous test for the "age" variable did not follow a normal distribution ($p = 0.000$), also supporting the use of nonparametric tests for other comparisons.

Subsequently, bivariate analyses were performed to examine associations between stress levels (as measured by the KEZKAK scale) and various sociodemographic and academic variables. Student's *t*-test for independent samples was used to compare mean stress scores between two groups (e.g., male and female students). One-way analysis of variance (ANOVA) was applied to assess differences across multiple groups (e.g., academic semesters). Pearson's chi-squared test was employed to evaluate associations between categorical variables. Additionally, Spearman's rho correlation coefficient was calculated to explore the relationship between ordinal or non-normally distributed variables, such as age and total stress score.

All statistical tests were conducted with a significance level set at $p < 0.05$.

3 Results

3.1 Sociodemographic variables

A total of 21.47% ($n = 40$) of the participants were men and 78.53% ($n = 150$) were women (Figure 1). The age range of the participants was 18–27 years, with a mean age of 21 years. Up to 88% ($n = 168$) of the sample stated that they had no children. Lastly, with regard to marital status, 92.1% ($n = 175$) were single, 6.8% ($n = 13$) were married, and 1% ($n = 2$) were in a relationship.

3.2 Academic variables

With respect to the academic characteristics of the sample, 37.7% ($n = 72$) of the participants had completed other nursing studies before they started studying the nursing degree, and only 5.2% ($n = 10$) were repeater students. Table 1 shows the distribution in terms of the semester in which the students were undertaking the clinical practicum.

3.3 Results of the KEZKAK scale

With regard to the stress level observed in the population sample, most of the participants (70.2%) presented a moderate or high stress level, and only 3.1% showed a very high stress level (Table 2).

The most relevant stressors were measured using the dimensions of the KEZKAK instrument. Table 3 shows the prevalence of each of them.

3.4 Correlation of the stress level with sex, marital status, number of children, semester in which the clinical practicum is undertaken, having previous nursing studies and being a repeater student

The analysis of the relationship between sex and stress level revealed a higher percentage of women with high stress level compared to men (26 and 17%, respectively). In regard with stress level as a function of marital status, the participants who represented the highest stress level were single (77% with moderate stress), and those who showed the lowest affectation were in a relationship (50% of the participants in a relationship presented no stress). The participants without children presented higher percentages of high stress level compared to those who

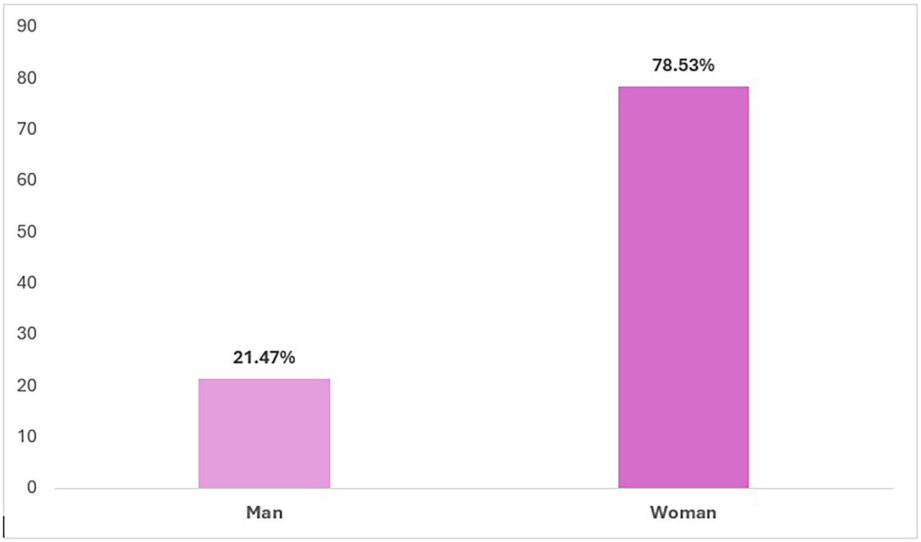

FIGURE 1
Distribution as a function of sex.

TABLE 1 Distribution as a function of the semester of the clinical practicum undertaken.

Semester	Frequency (*n*)	Percentage (%)
3rd	47	24.6
4th	22	11.5
5th	45	23.6
6th	18	9.4
7th	37	19.4
8th	22	11.5
Total	190	100

TABLE 2 Results of the KEZKAK scale.

Stress	Frequency (*n*)	Percentage (%)
No stress	50	26.2
Moderate stress	88	46.1
High stress	46	24.1
Very high stress	6	3.1
Total	190	100

had children (13 and 26%, respectively). In terms of stress level as a function of previous nursing studies, the participants who had completed previous nursing studies obtained a higher percentage of moderate stress than those who did not have previous nursing studies (49 and 39%, respectively). Lastly, the repeater students represented a higher percentage of moderate stress than the non-repeaters (60 and 46%, respectively). However, despite all these differences, no dependence relationships were observed for any of these variables with stress (Table 4).

In relation to stress level as a function of the clinical practicum, it was identified that the 7th semester obtained the highest stress level, with 57% of participants presenting moderate stress. On the other hand, the 5th semester presented the lowest stress level, with 47% reporting no stress. In this case, it was observed that these differences were statistically significant (ANOVA = 5.853; $p = 0.000$; CI 95%); thus, the semester in which the clinical practicum was being undertaken had an influence on the stress level of the sample.

3.5 Correlation between age and total score of the KEZKAK scale

The analysis of the association between age and the score obtained in the KEZKAK scale showed a correlation very close to zero, indicating that age had no influence on the scores of the scale (Table 5).

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TABLE 3 Most prevalent stressors measured through the dimensions of the KEZKAK instrument.

Dimensions	Stress level (%)			
	No stress	Moderate	High stress	Very high stress
Lack of competition	26	56.5	17	0.5
Contact with suffering	30	43.5	25	1.5
Relationship with tutors and peers	24.5	53.5	22	0
Helplessness and uncertainty	19	50.5	30	0.5
Not controlling the relationship with the patient	60	30	10	0
Emotional involvement	15	63	21	1
Damage to the relationship with the patient	70	20	10	0
The patient seeks an intimate relationship	60	25	15	0
Overload	10	68	20	2

TABLE 4 Group statistics and correlations between stress levels and sociodemographic and academic variables.

Variable		Stress level (%)			
		No stress	Moderate stress	High stress	Very high stress
Sex	Man	39	42	17	2
	Woman	23	48	26	3
	Student's *t*-test	0.631			
	Asymptotic sig. (bilateral)	0.428			
Marital status	Single	27	44	31	3
	Married	15	77	8	0
	In a relationship	50	50	0	0
	Pearson's chi-squared	6.619			
	Asymptotic sig. (bilateral)	0.578			
Has children	Yes	26	61	13	0
	No	26	44	26	4
	Pearson's chi-squared	3.524			
	Asymptotic sig. (bilateral)	0.474			
Semester in which he/she undertakes the clinical practicum	3	13	45	34	6
	4	36	55	9	0
	5	47	31	22	0
	6	6	56	28	11
	7	24	57	19	0
	8	24	48	29	0
	ANOVA	5.853			
	Asymptotic sig. (bilateral)	0.000			
Previous nursing studies	Yes	25	49	21	4
	No	27	39	26	3
	Pearson's chi-squared	2.769			
	Asymptotic sig. (bilateral)	0.597			
Repeater	Yes	20	60	20	0
	No	27	46	24	3
	Pearson's chi-squared	1.058			
	Asymptotic sig. (bilateral)	0.901			

TABLE 5 Correlation between age and the score of the KEZKAK scale.

Variables			Age	Total score
Spearman's Rho	Age	Correlation coefficient	1.000	−0.122
		Sig. (bilateral)		0.093
		N	191	190
	Total score	Correlation coefficient	−0.122	1.000
		Sig. (bilateral)	0.093	
		N	190	190

4 Discussion

The general aim of this study was to identify the level of stress experienced by nursing students during their clinical practicum at the Autonomous University of Aguascalientes (UAA), Mexico, across different semesters, taking into account a range of sociodemographic variables. The findings obtained through the KEZKAK questionnaire indicated that stress levels varied significantly by semester, with students in the seventh semester reporting the highest levels of stress. This may be related to the increased complexity of tasks and responsibilities assigned at this stage of training, combined with the greater expectations placed on students and their awareness of the potential consequences of clinical errors or uncertainty in decision-making (De Dios et al., 2017). In terms of sex, female students reported higher stress levels than their male counterparts. This difference may be associated with underlying sociodemographic factors that intersect with gender. For instance, women are often attributed additional personal or caregiving responsibilities that may increase overall stress levels (Obando et al., 2020). However, recent literature suggests a shifting trend in healthcare, with male professionals also experiencing increasing levels of stress, possibly due to less frequent use of effective coping strategies compared to women (Gago-Valiente et al., 2022a,b).

With regard to marital status, previous research presents mixed results. Some studies report higher stress levels among married individuals or those in a relationship (Toya et al., 2019), while others suggest that being single may be associated with increased stress, possibly due to the absence of emotional or logistical support (Marenco-Escuderos and Ávila-Toscano, 2016). In our study, married participants exhibited higher percentages of moderate stress. Similarly, students with children also showed higher levels of stress compared to those without children. This may be linked to the additional challenges associated with balancing academic demands and childcare responsibilities (Pérez et al., 2010).

Furthermore, in regard with the academic variables, novel students usually experience higher levels of stress due to their lack of knowledge about variables such as evaluation (Pérez et al., 2021). However, our results indicated that repeater students experienced greater levels of moderate stress, possibly reflecting anxiety related to past academic performance and fear of failure (Cabanach et al., 2016). The findings of this study are in agreement with this second line, where repeater students presented higher percentages of moderate stress than non-repeater students. The results of this work also demonstrated a greater representation of students with previous nursing studies who had moderate stress compared to those who did not have any previous nursing knowledge. These findings are not in line with those of other studies identified in the scientific literature, where students with greater knowledge and skills perceived their clinical practicum as less stressful (Cobo-Cuenca et al., 2012; Silva-Sánchez, 2015). This fact could be based on age, thus students with previous training are usually older and, therefore, have more responsibilities, which would involve a larger number of stressors and, consequently, a higher stress level (Gabel-Shemueli et al., 2012).

Finally, the relationship between age and stress remains inconclusive in the literature. While some authors report a negative correlation—suggesting that older students experience less stress (Martínez-López and López-Solache, 2005; Cavalheiro et al., 2008)—others find no significant association (Costa and de Sousa, 2011). In line with the latter, our study found no statistically significant relationship between age and perceived stress levels.

Given the moderate to high levels of stress identified among nursing students, particularly in relation to practicum semester, gender, family responsibilities, and academic trajectory, it is essential to consider supportive frameworks that promote well-being and resilience. Interventions grounded in Positive Psychology offer a promising avenue in this regard. Evidence suggests that strategies such as mindfulness training, gratitude journaling, and resilience-building exercises can enhance emotional regulation, improve stress management, and foster more positive learning environments (Lanz, 2020; Lo and Punzalan, 2025). These approaches have been effective among faculty and healthcare professionals and are highly transferable to student populations in high-stress disciplines such as nursing. Integrating PP-based practices into nursing education, through short workshops, embedded curriculum components, or institutional support programs, may not only mitigate stress but also cultivate a culture of self-care and emotional competence among future professionals (Dai et al., 2025).

4.1 Recommendations for practice

Based on the findings of this study and supported by recent literature on Positive Psychology (PP), several actionable recommendations can be proposed to help reduce stress and promote well-being among nursing students during their clinical practicum. These recommendations aim to provide both immediate coping tools and long-term structural support within nursing education programs:

- Incorporate brief mindfulness practices and gratitude journaling into the clinical practicum curriculum. These low-cost, evidence-based strategies can enhance emotional regulation, reduce perceived stress, and promote reflective learning.

- Develop resilience workshops specifically designed for nursing students, focusing on positive coping strategies, self-awareness, and emotional regulation in high-pressure clinical environments.
- Foster a culture of well-being through faculty involvement, encouraging educators to model PP practices such as empathy, optimism, and strengths-based feedback. This can contribute to the creation of psychologically safe learning spaces.
- Design and implement institutionally supported PP programs that are culturally relevant and sustainable. These may include structured mentoring schemes, peer support initiatives, or integrated well-being modules that align with the realities of clinical education.

We advocate for the implementation of PP initiatives that are embedded in the institutional framework, such as structured mindfulness programs or integrated gratitude-based practices, to ensure their long-term impact and sustainability in nursing education.

4.2 Limitations and future research lines

This study presents some limitations that must be pointed out. Due to its cross-sectional design, it was not possible to observe the changes that many of the analyzed variables may undergo in time, which could modify the scores of numerous objective and subjective indicators (González-Jiménez et al., 2016). Likewise, it would be convenient to explore the possible psychiatric history of the participants and incorporate items in the data collection surveys about access to resources (financial, social, medical, etc.). Therefore, it would be very interesting to carry out prospective studies, with the same sample population, including new items with more variables, in order to further evaluate the circumstances and possible changes.

Another limitation of this study is related to the sample size. Although the number of participants represents the reality of this student group in the analyzed educational center, the conclusion cannot be extrapolated to other centers.

To sum up, it would also be fundamental to carry out further research with a larger number of participants to guarantee and increase the external validity of the conclusions, involving more educational centers.

5 Conclusion

This study provides evidence on a series of mental health indicators in nursing students, thereby updating the information about this topic to contribute to future intervention lines that address this situation. This paves the way for future and larger studies in this line.

Nursing students who carry out their clinical practicum show moderate stress levels. The clinical practicum represents a transmission of knowledge that will help students to become professionals. Therefore, in order to fulfill their main duty of providing care, students must take care of their own health.

The faculty at the clinical field must support and strengthen the learning capacity of the students, creating an environment that reduces or removes some stressors and generates a better climate for the mental health care of the students who undertake their clinical practicum.

To conclude, it is fundamental to be able to use the results of this study from a psychosocial and educational approach, with the aim of changing the vulnerable objectives through the design and implementation of formative and preventive programs.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving humans were approved by Research Ethics Committee of Aguascalientes (code: AEI-14-19). The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

G-PD-L-P: Conceptualization, Investigation, Supervision, Writing – original draft, Formal analysis, Methodology. K-AV-L: Conceptualization, Investigation, Methodology, Supervision, Writing – review & editing. VC-P: Conceptualization, Investigation, Methodology, Supervision, Writing – review & editing, Formal analysis. F-JG-V: Conceptualization, Investigation, Supervision, Writing – original draft. E-IM-T-d-C: Conceptualization, Supervision, Writing – review & editing. M-d-l-ÁM-G: Conceptualization, Formal analysis, Investigation, Methodology, Writing – original draft, Writing – review & editing.

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Conflict of interest

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