



ORIGINAL ARTICLE

**Analysis of stressors in fifth-semester medical students: a quantitative and qualitative approach**

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**ABSTRACT**

**Introduction:** academic stress is a frequent phenomenon among university students, especially in Medicine, impacting their physical and psychological health.

**Objective:** to analyze the main stress factors in fifth-semester medical students.

**Methods:** a descriptive, cross-sectional study with a mixed approach was conducted at the Universidad Regional Autónoma de los Andes in 2024. Eighty-seven students participated, selected through non-probabilistic convenience sampling, who met the inclusion criteria. The application of an instrument allowed the collection of information that addressed the analyzed variables, using descriptive statistical methods. Medical ethics were respected.

**Results:** most students were located in zone 3 (39 %), followed by zone 4 (32 %) and zone 5 (27 %), the latter associated with a high risk of psychological impairment. The most influential stress factors were personality (2097 points), interpersonal relationships (2060), and work/occupation (1883). Sociodemographic variables such as marital status, age, and employment situation were found to increase the final score in certain cases.

**Conclusions:** the findings show that personality is the main stressor among medical students, followed by relationships and occupation. The significant prevalence of young people in high-stress zones highlights the need to implement psychosocial intervention strategies and emotional support programs to prevent negative consequences on mental health and optimize academic performance.

**Keywords:** Stress, Psychological; Students, Medical; Mental Health.

## INTRODUCTION

Stress constitutes a central construct in the study of human behavior and health, classically defined as a dynamic relationship between the individual and their environment that is perceived as threatening or overwhelming personal resources, thereby compromising physical and psychological well-being.<sup>(1)</sup> In the educational context, this phenomenon acquires particular relevance under the term academic stress, understood as the student's response to the demands and requirements inherent to the training environment, which may exceed their coping capacity.<sup>(2)</sup>

From a historical perspective, the concept of stress has undergone significant theoretical evolution. While in the 19th century Claude Bernard emphasized the role of stress-inducing stimuli, in the 20th century Walter Cannon focused on the organism's physiological and behavioral responses to threatening situations. Subsequently, Hans Selye integrated these perspectives by proposing a systemic model that described the body's adaptive responses and the organic consequences resulting from prolonged stress exposure.<sup>(3)</sup> However, this model was criticized for underestimating the influence of psychological and cognitive factors in the stress experience.

Contemporary models recognize that stress does not depend solely on physiological responses but also on the interaction among life events, social conditions, and individual characteristics, which can act as either risk or protective factors against its negative effects.<sup>(4)</sup> In this sense, Lazarus and Folkman conceptualize stress as a cognitive appraisal process in which the individual evaluates situational demands in relation to the available resources to cope with them.<sup>(1)</sup>

In the academic context, stress is configured as a complex psychological process involving the identification of stressors, the manifestation of physical and emotional symptoms—such as difficulty concentrating, irritability, or appetite disturbances—and the implementation of coping strategies aimed at restoring biopsychosocial equilibrium.<sup>(5)</sup> This adaptive process is associated with activation of the neuroendocrine system and changes in biomarkers related to inflammatory and hormonal responses, such as cortisol and various interleukins.<sup>(6,7)</sup>

University students represent a population particularly vulnerable to academic stress due to the cognitive, emotional, and social demands inherent to this formative stage. Often, these individuals do not recognize the impact of stress or its associated symptoms, which promotes its chronicity and the emergence of adverse physiological responses, especially in situations of acute or chronic stress.<sup>(8,9,10)</sup> Therefore, this study was deemed essential, with the objective of analyzing the main stressors affecting fifth-semester medical students.

## METHODS

An observational, descriptive, cross-sectional study with a mixed (quantitative and qualitative) approach was conducted. This design was chosen to identify and characterize the primary stressors among medical students at a specific point in time, without manipulation of variables, and to obtain an integrative understanding of the phenomenon.

The research was carried out at the Autonomous Regional University of the Andes (UNIANDES), Ambato campus, Ecuador, between January and June 2024. The population consisted of fifth-semester medical students. Inclusion criteria comprised students officially enrolled in the fifth semester, from any academic section, who voluntarily agreed to participate in the study. Exclusion criteria included students from other academic levels and those who submitted incomplete forms. The final sample consisted of 87 students, selected through non-probability convenience sampling according to the established inclusion criteria.

### Procedures and Techniques

Data collection was carried out through the in-person administration of a structured questionnaire titled "Academic Stress Test No. 1," composed of 96 items distributed across six domains: lifestyle, environment, symptoms, employment/occupation, interpersonal relationships, and personality. Each item was scored on an ordinal scale, and the total score enabled the classification of participants into one of five stress zones (Zone 1: minimal; Zone 5: maximum).

The primary variables were academic stress level and stressors (defined as the accumulated scores in each domain of the questionnaire). Secondary variables included sociodemographic characteristics (age, sex, marital status, number of children, employment status, and place of residence), recorded through closed-ended questions within the same instrument. Data were collected on individual response sheets and subsequently digitized into a database for analysis.

### Statistical Analysis

The analysis was performed using descriptive statistics. Absolute and relative frequencies were calculated for categorical variables, as well as measures of central tendency and dispersion for quantitative variables. Results were presented in tables and distribution graphs.

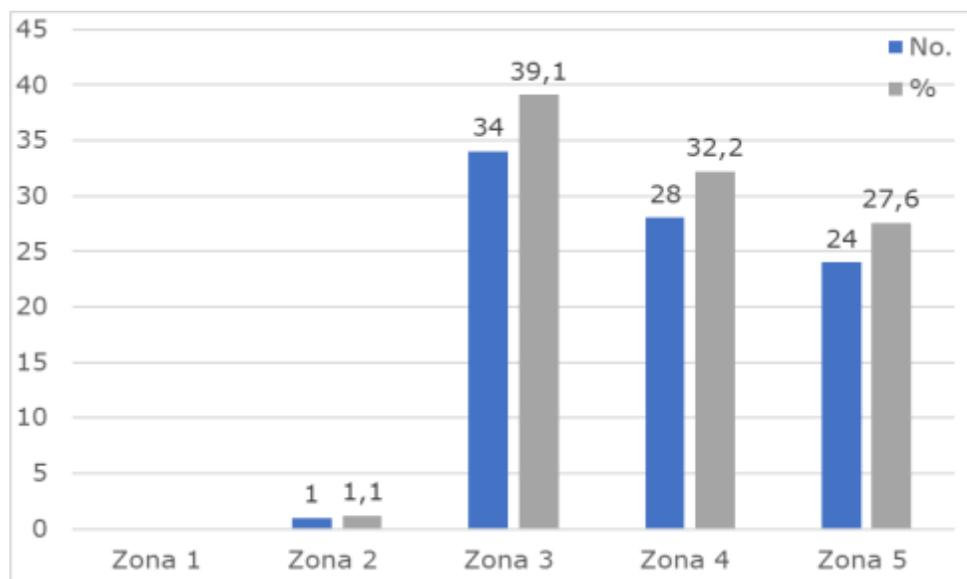
Data processing was conducted using IBM SPSS Statistics software, version 25. A significance level of 0,05 was established for the statistical tests applied. Missing data were handled through case exclusion, and potential biases were minimized by standardizing the questionnaire administration procedure and ensuring anonymity in responses.

### Ethical Considerations

The study received approval from the Ethics Committee of the Faculty of Medical Sciences at the Autonomous Regional University of the Andes. All participants received written information about the research objectives and procedures and signed an informed consent form prior to completing the questionnaire. Data confidentiality and student anonymity were guaranteed. The research was conducted in accordance with the ethical principles of the Declaration of Helsinki and international standards of good practice in biomedical research.

## RESULTS

As shown in Figure 1, a higher proportion of students were classified in Zone 3 (34 students, 39 %), considered the normal stress level. However, a considerable number were found in Zone 4 (28 students, 32 %) and Zone 5 (24 students, 27 %), both associated with high and dangerous levels of stress. This finding indicates that more than half of the participants exhibited stress levels requiring preventive attention or immediate intervention.



**Fig. 1** Distribution of the sample according to stress level by zones.

The results show that the factors with the greatest impact were personality (2097 points) and interpersonal relationships (2060 points), followed by work/occupation (1883 points). This indicates that internal stressors linked to personal traits and social dynamics exerted a greater influence than external factors related to academic or occupational workload.

Being single/widowed and being aged 25–34 years were the most frequent conditions that increased stress scores. Living in a large city (27 students) and unemployment (2 students) also contributed to higher stress burden. Although less common, these circumstances reflect that urban context and lack of job stability can significantly worsen students' final stress scores.

## DISCUSSION

The finding that more than 50 % of students were classified in high-stress zones (Zones 4 and 5) aligns with previous studies in Latin American contexts, where a significant prevalence of moderate to severe academic stress has been reported. In studies conducted in Colombia and Peru, between 40 % and 60 % of university students have been found to experience stress levels that impair their performance and well-being.<sup>(5,11)</sup> However, the proportion observed in this study is slightly higher, suggesting that the analyzed population faces specific conditions that intensify the stress response. This finding underscores the need to implement preventive strategies and psychological support programs within the university setting.

The predominance of personality and interpersonal relationships as the main stressors reflects the importance of internal and social factors in the experience of academic stress. Critical reviews have indicated that personality traits such as perfectionism and low frustration tolerance increase vulnerability to stress.<sup>(12)</sup> Similarly, social dynamics—particularly interpersonal conflicts—have been identified as significant predictors of psychological distress.<sup>(13)</sup> In contrast, other studies highlight academic workload as the primary stressor, marking a difference with the results presented here. This discrepancy may be attributed to cultural and contextual variations, where social bonds and personal characteristics carry greater weight in the perception of stress.<sup>(14)</sup>

The association between being single/widowed and higher stress levels is consistent with studies indicating that the absence of stable emotional support increases psychological vulnerability. Likewise, the age range of 25–34 years has been linked to elevated stress due to the transition toward professional and family responsibilities.<sup>(15)</sup> The finding that living in a large city and unemployment increase stress burden aligns with research showing that the urban environment—characterized by competitiveness and overstimulation—and lack of job stability are risk factors for mental health. Although less frequent in this sample, these conditions illustrate the interaction between structural and personal factors in shaping academic stress.<sup>(16)</sup>

Overall, the results suggest that stress among university students cannot be explained solely by academic workload, but rather stems from a complex interaction of internal, social, and contextual factors. Similarities with prior studies reinforce the need for multifactorial intervention programs, while discrepancies highlight the importance of considering the cultural and sociodemographic particularities of each population. Identifying these patterns can guide university policies toward promoting mental health and preventing psychological burnout.<sup>(5,17,18)</sup>

## CONCLUSIONS

The study conducted among fifth-semester medical students at the Autonomous Regional University of the Andes revealed a high prevalence of academic stress, with more than half of participants classified in high-risk stress zones (Zones 4 and 5). The main stressors were personality, interpersonal relationships, and work/occupation, reflecting the decisive influence of individual traits and social dynamics on the stress experience—beyond academic workload. Additionally, sociodemographic variables such as marital status, age, and employment status increased psychological vulnerability in certain cases. These findings underscore the need to implement psychosocial strategies and emotional support programs within the university setting, aimed at preserving mental health and optimizing academic performance.

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