

STRESS PROFILE AND COPING STYLES IN MEDICAL UNIVERSITY STUDENTS

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Abstract

The medical career is characterized by a constant and growing academic demand that demands adaptation efforts from the student. Added to this is the need for optimal preparation, essential for a professional future in an increasingly competitive labor market and developing in a period of the life cycle with characteristics typical of adolescence and young adulthood. The objective of this study was to identify the stress profile and coping styles that occur in students of the medical surgeon career. Therefore, a descriptive, cross-sectional and analytical study was followed. The instrument was the Stress Profile developed by Nowack, applied to 395 students of the Medical Surgeon degree from the Tampico School of Medicine of the Autonomous University of Tamaulipas. The results show that there is a correlation between stress, study habits, exercise, rest/sleep, food/nutrition, positive assessment, minimization of the threat, concentration on the problem and psychological well-being, in addition to the fact that in the ninth and first-grade

students presented medium and low stress respectively and that women mostly have medium stress and low in men. It is concluded that working with students in a preventive health program that generates changes in lifestyles and coping in stressful situations is a priority.

Keywords: stress; coping; students; medicine

1. Introduction

Currently, it is common to use the term stress in various contexts and activities of daily life, both in the workplace and in education, since both workers, teachers and students are subject to situations of stress caused by the influence of areas that potentially generate these scenarios where the university student may be one of them (Madrid and Moreno, 2019). Stress is a risk factor for health, well-being and quality of life since it is “the individual’s response to conditions that threaten him and are difficult to manage” (Pozos et al., 2022, p. 18). Stress can occur in students of all levels and ages since it is a reality that is registered in academic institutions, with the profiles of health sciences having the greatest impact (Madrid and Moreno, 2019) since it occurs during a period of the life cycle between adolescence and young adulthood and in this sense it is related to the increase in cognitive and behavioral efforts called coping styles or strategies in order to adapt and have the least possible damage to both their physical health as psychological (Lanuque, 2020).

Stress is the pressure generated by both external and internal means derived from emotional and physical demands that require psychological and physiological adjustments by the person in that situation. According to the cognitive approach, how the individual interprets a particular situation and decides to face it is decisive for it to become stressful; that is, cognitions are a very important mediator between stressful stimuli and stress responses (Usha and Solomon, 2022). Today people can feel stress for reasons as varied as waiting for the answer to the grade of an important exam, having disagreed with their boss at work, when they are going on a trip or meeting someone, among others. Thus, stress is part of the common human experience and is linked to various situations such as emotional arousal, effort, fatigue, pain, fear, humiliation, and even unexpected great success (Becker, 2022).

Derived from the above, De la Roca et al. (2019) mention that coping strategies are the cognitive or behavioral responses to manage and minimize the external or internal demands that produce stressful situations; that is, when the student faces such a scenario, he preliminarily evaluates to determine if the situation is manageable, positive, changing or irrelevant; Next, he identifies the resources available to him and the possible options to deal with the situation, through adaptation strategies, which may be oriented towards the problem causing the stress or cognitive behavior aimed at coordinating a person’s emotions. More effectively (Martínez et al., 2020), protective

coping strategies work best when stressful situations are controlled; otherwise, they could cause lung disease or death (Pozos et al., 2022).

2. Literature review

2.1 Stress

The concept of stress comes from physics and in this context, its definition refers to the external pressure applied to some material or object that generates tension or distortion. According to the English physicist Robert Hooke, if the stress applied to the material does not exceed its elastic limits, then the material is not altered (Camacho, 2020). In 1926, the Austro-Hungarian physiologist and physician Hans Hugo Bruno Selye, while he was in his second year of medicine, noticed the existence of common symptoms in patients who did not have a diagnosed disease and among which were loss of appetite, high blood pressure, apathy, chronic fatigue, among others, calling this collection general adaptation syndrome (Cortés, 2021). Later Selye used the concept of stress from physics and adapted it to the health context as “the sum of non-specific changes within an organism, caused by a function or damage, or the rate of wear and tear on the body” (Selye, 1956, p. 4).

Currently, from Selye’s perspective, physiological, perceptive and cognitive elements are taken into consideration for the study of stress, so its definition is more complex, being “the sum of the non-specific effects of factors such as daily activities, stress-producing agents illnesses, drugs, inadequate life habits, abrupt changes in the work, academic and family environment, etc., that can act on the person” (Selye, 1960, p. 329). As these changes cause stress and regardless of each person’s response or way of reacting, any good or bad physical, psychological or emotional demand provokes an identical and stereotyped biological response of the organism (Bolaños et al., 2020).

Derived from the above, the approach to stress has been carried out in various ways and under different theoretical approaches, some focusing on the organic response and others only studying the stimuli or external factors that trigger the stress response. However, being the transactional model of the stress of Folkman et al. (1986) one of the most accepted since the subject plays a key role and the stress response originates from the appreciation or cognitive evaluation related to the situation or problem to the one that faces; where cognitive appreciation refers to the process by which the person evaluates the context of the environment in which they find themselves and whether or not it is relevant to their well-being and, if so, how it impacts them, so stress is the consequence of the perception that the individual has about the situation and not the situation itself (Tacca and Tacca, 2019).

The assessment process is divided into three phases, the primary one, where the effect of the meeting is evaluated and if it represents a risk or benefit; the secondary, where it is evaluated if something can be done to prevent/avoid the risk or maximize the potential benefit; coping refers to the actions and strategies of the person aimed at managing external and internal demands once they have been evaluated as a threat, stress occurring when what is perceived as threatening exceeds the coping resources perceived (Peláez et al., 2021). In the study of stress, the terms stress and stressor are used, stress being the physiological reaction or response and stressor any stimulus that gives rise to stress response (Sánchez, 2020).

According to Conti, Mas and Sampol (2018), stressors are classified according to their nature in five categories; physical, chemical, physiological, intellectual and psychosocial; Cardona and Caballero (2019) divide stressors into major and minor, where major stressors are events whose quality does not depend on the subject's perception and can be, for example, natural disasters, life cycle changes, moving or changes in educational level, while the minor ones are those in which the appearance of stress depends entirely on the person's perception (Sanchez et al., 2022).

Stress is implicit in any activity, context, and human interaction; however, the stressors that occur when the stress response appears to vary according to the context and interactions involved. Folkman et al. (1986) mention that stress is an organizing concept of different variables and processes, so to study it, it is classified considering the source as well as being linked to the presence of specific stressors of the environment or situation and that they do not appear in any other due to stress. Study separately, finding work stress, post-traumatic stress, prenatal stress, or academic stress; however, people can talk about stress as a general concept, but according to the different professions that exist, stressors and risks will always be different (Camacho, 2020).

2.2 Academic stress

Academic stress is “the body's response to stressors that occur within the educational space and that interfere with behaviors such as study or class attendance” (Chavarriaga et al., 2018, p. 2), which affect cognitive processes and generate problems in students such as short-term and long-term memory failures, a decrease in the ability to plan and organize time, attention and concentration problems, causing a direct impact on their performance (Mas et al., 2022). Another definition of academic stress is an adaptive process where students are subjected to a series of demands that they consider stressful and provoke a stress response. It manifests itself in symptoms that force them to carry out coping actions, appearing at all educational levels and increasing as the student goes up the level experiencing greater intensity in higher education. This is because the university is a social, institutional and educational space with many demands that can be perceived as stressors (Parillo and Gomez, 2019).

For Barraza and Barraza (2019), academic stress is “a systemic process of an adaptive and essentially psychological nature that is presented descriptively in three moments” (p. 75), first, the student is subjected in school contexts to a series of demands that under their assessment are considered stressors, second, these stressors cause imbalance, that is, a stressful situation that manifests itself in a series of symptoms (indicators of imbalance) and third, that systemic imbalance forces the student to carry out coping actions to restore balance (Silva et al., 2020). In addition, university students are in the process of multiple transitions since, while they are moving from adolescence to adulthood, they are moving from high school to university, and both scenarios represent a challenge that increases vulnerability to stress since it includes having to maintain academic standards, adjust to a new social life, adopt new roles and modify existing ones by developing their identity; in the case of international students, living independently, managing their finances, feelings of loneliness and social isolation are added (Pérez et al., 2020).

Hasan et al. (2018) mention that the consequences of academic stress are arranged in four categories according to the area they affect, which are affective, physical, cognitive, and behavioral. In addition to the above, the university as a space generates inadequate lifestyles that further facilitate the presence of these problems. In the physical aspect, a wide variety of symptoms such as migraines, sleep disorders, digestive problems, chronic fatigue, vomiting, facial paralysis, decreased immune system and psychosomatic reactions negatively influence the patient’s academic performance and well-being. Furthermore, these stressors are linked to changes in the sleep cycle, changes in mealtimes and little physical activity due to work overload and evaluation periods (Tingal and Briones, 2018).

Among the affective, cognitive, and behavioral consequences are anxiety, irritability, low self-esteem, attention problems, perception of decreased self-efficacy, social isolation, perception of lack of support, apathy, fits of anger and frustration, which can lead to depression according to several studies (Calle et al., 2018; Parillo and Gómez, 2019; Valdivieso et al., 2020; Llanes et al., 2022; Rivadeneira et al., 2022). In this sense, medical students are constantly exposed to academic pressures and demands, which affect their performance, physical health, and psychosocial well-being; In this context, the program that students must complete requires compliance with curricular and extracurricular activities, among which are scientific, political, ideological, cultural, sports, and social activities, which are included within the requirements of their academic training. This can lead to an overload affecting their mental health and lead to alcohol and drug abuse, irresponsible sexual behavior, difficulties in interpersonal relationships, depression, anxiety and even school dropout (Contreras et al., 2022), (Montes de Oca et al., 2022)

2.3 Coping

Uribe et al. (2018) define coping as “the mechanism by which individuals reestablish a sense of control over their environment and themselves in response to a stressful experience” (p. 442). The concept of coping has changed over time since initially, its foundation was based on two different models, the so-called animal model from behavioral psychology considering behavioral responses to environmental stimuli and the ego psychology model from currents of psychology related to psychoanalysis and the defense mechanisms proposed by it; however, Lazarus and Folkman (1987) postulated that coping has two main functions, to change or eliminate problematic conditions in the person-environment relationship and to regulate emotional stress.

Considering these two functions, coping is carried out as a dynamic process that depends on how the person perceives the context and consequently modifies the person-environment relationship, which implies that the behavioral, cognitive and emotional responses that are configured as coping strategies or patterns fluctuate over time and according to the context (Rivadeneira et al., 2022). Herrera et al. (2021) propose two categories of coping developed by different researchers: problem-focused strategies that use specific behaviors to solve the problem and reduce stress, and emotion-focused strategies where emotions are expressed in trying to reassess the situation.

Previous research gave rise to different classifications for these strategies, such as the one proposed by Deatherage et al. (2014), which divides coping strategies into three: problem-focused, active emotional, and avoidant emotional, expanding on this idea Díaz and Yaringaño (2010) and Castillo and Montes de Oca (2021) point out that strategies based on active coping are possible with a positive result in environments and situations susceptible to change. Otherwise, they will only produce increased stress and frustration, considering that coping is linked to the emotions that the person experiences towards the context, which depends on the personality, values and beliefs.

2.4 Stress and coping

The ways of coping with stress are constantly changing due to different determining factors; according to Cabanach et al. (2018), a determining factor is time since the individual can use a different way of coping each day, depending on the circumstances. Another determining factor is the social environment since coping strategies are based on stressors and social resources, influencing the person’s personality, mentality and behavior (Conti et al., 2018). Likewise, Cachique and Zegarra (2021) mention that the preference of the coping strategy is due to situational factors such as the socialization process since influences can determine the actions and be of people, even in the face of limitations that need another response.

Rojas (2018) adds that individual and social factors also determine the use of coping strategies, the predisposing characteristics of people, personal aspects, social pressures, experiences and

cultural differences. On the other hand, Maldonado and Muñoz (2019) problem-focused coping modes are used in situations of controllable stress and emotion-focused strategies are usually used when the person perceives an uncontrollable level of stress. Lastly, strategies focused on avoidance are used when the person postpones active coping to order and collect their psychosocial resources before facing a stressful situation.

3. Method

The research has a quantitative approach to the design. It is a descriptive, cross-sectional and analytical type of research; since the stress profile was analyzed about age, gender, and semester, as well as to identify the variables that contribute to their health or put it at risk, the data collection was in a single moment of the school period. The population is made up of students of the medical surgeon career at the Autonomous University of Tamaulipas in the first, fifth and ninth semesters and the sample consisted of a total of 395 students selected by convenience, of which 58.0% (229) are of the female sex and 42.0% (166) belong to the male sex, concerning age, the results obtained show that 43.5% (172) are between 16 and 18 years old, 32.7% (129) between 19 and 21 years old, 21.8% (86) between 22 and 24 years old and 2.0% (8) between 25 and 27 years old. The technique used was the survey applied in one week to all the participants in the faculty classrooms and the instrument to collect the data was the Stress Profile, which identifies characteristics and behaviors that protect against or contribute to stress-related diseases (Nowak, 2002: 147). This test is based on the Lazarus cognitive-transactional theory used in several tests and generates T-scores for 15 dimensions: stress, health habits, exercise, rest/sleep, food/nutrition, prevention, ARC cluster, social support network, behavior type A, cognitive strength, positive appraisal, negative appraisal, threat minimization, problem focus, and psychological well-being (Haynes et al., 1980: 38). The stress profile was developed and standardized for the general population, being adapted and translated into Spanish for its application. Statistical Package for Social Sciences (SPSS, 2010) version 2022 was used to evaluate the statistical analysis, systematizing the results through frequency and percentage tables.

4. Results

The results describe the coping responses to stress presented by the 395 students of the medical surgeon career, which they showed.

About the categorized stress variable, it was observed that 49.9% (197) obtained a medium level, followed by 45.8% (181) with a low level, and finally, a high level with 4.3% (17), as shown in the Table. 1.

Table 1. Categorized stress.

	Frequency	Percentage	Valid percentage	Cumulative percentage
Low stress	181	45.8	45.8	45.8
Medium stress	197	49.9	49.9	95.7
High stress	17	4.3	4.3	100.0
Total	395	100.0	100.0	

The cross analysis carried out between gender and stress resulted in 4.4% (10) of females presenting at a high level, 56.3% (129) at a medium level and 39.3% (90) at a low level; on the contrary, in the male sex, the high level was obtained in 4.2% (7), the medium in 41.0% (68) and the low in 54.8% (91), Table 2 ($X^2 = 9.620$ $p = .008$).

Table 2. Cross analysis between gender and stress.

		Categorized stress			Total
		Low stress	Medium stress	High stress	
feminine	Count	90	129	10	229
	% within gender of medical students	39.3%	56.3%	4.4%	100.0%
male	Count	91	68	7	166
	% within gender of medical students	54.8%	41.0%	4.2%	100.0%
Count		181	197	17	395
% within gender of medical students		45.8%	49.9%	4.3%	100.0%

Chi-square tests

	Value	gl	Asymptotic sig. (bilateral)
Pearson chi-square	9.620 ^a	2	.008
Likelihood ratio	9.649	2	.008
Linear by linear association	7.165	1	.007
N of valid cases	395		

a. 0 cells (0.0%) have an expected frequency less than 5. The minimum expected frequency is 7.14.

Concerning the cross analysis carried out between the semester and stress, it can be observed that in the first semester students, the results obtained show high stress at 1.6% (4), medium stress at 39.0% (96) and stress under 59.3% (146); in the fifth semester, high stress was present in 12.5% (7), medium stress in 66.1% (37) and high stress in 21.4% (12); and in the ninth semester, it was found that 6.5% (6) presented high stress, 68.8% (64) medium stress and 24.7% (23) low stress, table 3 ($X^2 = 9.620$ $p = .008$).

Table 3. Cross analysis between semester and stress

		Categorized stress			Total
		Low stress	Low stress	Low stress	
First semester	Count	146	96	4	246
	% within gender of medical students	59.3%	39.0%	1.6%	100.0%
Fifth semester	Count	12	37	7	56
	% within gender of medical students	21.4%	66.1%	12.5%	100.0%
Ninth semester	Count	23	64	6	93
	% within gender of medical students	24.7%	68.8%	6.5%	100.0%
Count		181	197	17	395
% within gender of medical students		45.8%	49.9%	4.3%	100.0%

Chi-square tests

	Value	gl	Asymptotic sig. (bilateral)
Pearson chi-square	9.620 ^a	2	.008
Likelihood ratio	9.649	2	.008
Linear by linear association	7.165	1	.007
N of valid cases	395		

a. 0 cells (0.0%) have an expected frequency of less than 5. The minimum expected frequency is 7.14.

Table 4 shows that the Pearson correlation coefficient indicates that there is a significant relationship between stress and health habits ($r = .440$, $p = .000$), and also between health habits and exercise ($r = .395$, $p = .000$), health and rest/sleep habits ($r = .472$, $p = .000$) and health and food/nutrition habits ($r = .371$, $p = .000$).

Table 4. Pearson correlation analysis between variables stress, health habits, exercise, rest/sleep and food/nutrition.

		stress	health habits	exercise	rest/sleep	food/nutrition
stress	Pearson correlation	1	.440**	.016	.317**	.125*
	Sig. (bilateral)		.000	.751	.000	.013
	N	395	395	395	395	395
health habits	Pearson correlation	.440**	1	.395**	.472**	.371**
	Sig. (bilateral)	.000		.000	.000	.000
	N	395	395	395	395	395
exercise	Pearson correlation	.016	.395**	1	-.038	.058
	Sig. (bilateral)	.751	.000		.454	.251
	N	395	395	395	395	395
rest/sleep	Pearson correlation	.317**	.472**	-.038	1	.152**
	Sig. (bilateral)	.000	.000	.454		.002
	N	395	395	395	395	395
food/nutrition	Pearson correlation	.125*	.371**	.058	.152**	1
	Sig. (bilateral)	.013	.000	.251	.002	
	N	395	395	395	395	395

** . The correlation is significant at the 0.01 level (bilateral).

* . The correlation is significant at the 0.05 level (bilateral).

Table 5 shows that the Pearson correlation coefficient indicates no significant relationship exists between prevention, ARC (use of substances, drugs, alcohol), social support network, type A behavior, and cognitive strength.

Table 5. Pearson’s correlation analysis between variables prevention, ARC, social support network, type A behavior and cognitive strength.

		prevention	ARC(use of substances drugs alcohol)	social support network	behavior type A	cognitive strength
prevention	Pearson correlation	1	-.267**	.003	.278**	-.063
	Sig. (bilateral)		.000	.960	.000	.210
	N	395	395	395	395	395
ARC(use of substances drugs alcohol)	Pearson correlation	-.267**	1	.097	-.077	-.007
	Sig. (bilateral)	.000		.053	.125	.884
	N	395	395	395	395	395
social support network	Pearson correlation	.003	.097	1	.125*	.116*
	Sig. (bilateral)	.960	.053		.013	.021
	N	395	395	395	395	395
behavior type A	Pearson correlation	.278**	-.077	.125*	1	-.178**
	Sig. (bilateral)	.000	.125	.013		.000
	N	395	395	395	395	395
cognitive strength	Pearson correlation	-.063	-.007	.116*	-.178**	1
	Sig. (bilateral)	.210	.884	.021	.000	
	N	395	395	395	395	395

** . The correlation is significant at the 0.01 level (bilateral).

* . The correlation is significant at the 0.05 level (bilateral).

Table 6 shows that the Pearson correlation coefficient indicates that there is a significant relationship between positive assessment and minimization of the threat ($r = .427, p = .000$), positive assessment and concentration on the problem ($r = .405, p = .000$) and positive appraisal and psychological well-being ($r = .514, p = .000$), also between threat minimization and psychological well-being ($r = .356, p = .000$).

Table 6. Pearson's correlation analysis between variables positive assessment, negative assessment, minimization of threat, concentration on the problem and psychological well-being.

		positive feedback	negative feedback	threat minimization	concentration on the problem	psychological well-being
positive feedback	Pearson correlation	1	-.232**	.427**	.405**	.514**
	Sig. (bilateral)		.000	.000	.000	.000
	N	395	395	395	395	395
negative feedback	Pearson correlation	-.232**	1	-.198**	.078	-.297**
	Sig. (bilateral)	.000		.000	.124	.000
	N	395	395	395	395	395
threat minimization	Pearson correlation	.427**	-.198**	1	.243**	.356**
	Sig. (bilateral)	.000	.000		.000	.000
	N	395	395	395	395	395
concentration on the problem	Pearson correlation	.405**	.078	.243**	1	.246**
	Sig. (bilateral)	.000	.124	.000		.000
	N	395	395	395	395	395
psychological well-being	Pearson correlation	.514**	-.297**	.356**	.246**	1
	Sig. (bilateral)	.000	.000	.000	.000	
	N	395	395	395	395	395

** . The correlation is significant at the 0.01 level (bilateral).

5. Discussion

Stress can function as an activator of the immediate response of the organism in order to enable the performance of complex tasks, increasing the speed of execution, so it becomes a coping style; observing that the average levels of stress were presented in the ninth-grade students and low stress in first-year students; concerning gender in women there was medium stress and in men low stress.

In their research, Lemos et al. (2018) showed that 64% of the medical students evaluated present significant stress levels and that around half of the students present depression and anxiety. Along the same lines, Otero et al. (2020) mention that school grade influences stress, which is higher in students at the end of the degree, mainly in behavioral indicators.

The investigations carried out by Cabanach et al. (2018), Lemos et al. (2018) and Jiménez and Sánchez (2011) found that medical students at public universities in Mexico who give negative evaluations and do not use threat minimization as a coping strategy in the face of stress suffer more symptoms of chronic stress. Furthermore, these studies mention that medical students present higher levels of stress than any other profession in the academic context since they generate responses to minimize the threat, positive evaluations, aggressive attitude, lack of problem-solving as well as social support (Preciado and Vázquez, 2010; Hernández and Moreno, 2017; Carbadillo and Canabach, 2019; Ortiz et al., 2019).

The differences identified in these studies between females and males are because coping strategies different from those already reported are analyzed, such as emotional aspects, problem-solving, cognitive aspects and social support (López and González, 2017). However, it is common to find studies from other countries that relate academic stress with anxiety that occur in different professions and different school contexts (Guevara et al., 2021).

The results found by Pozos et al. (2022) agree with those found in this research, where the female sex has a higher mean in the score for chronic stress, as well as in the coping variables compared to the male, so it is important to follow up on the population studied given the vulnerability in order to eliminate the risks or, failing that, reduce them, since chronic stress has a strong effect on health and is present in the daily lives of students; its consequences are detrimental to the health of students and their academic performance, in addition to being associated with disorders of depression, anxiety, irritability, low self-esteem, insomnia, asthma, high blood pressure and ulcers, among others, so it is a priority to use adequate coping strategies to manage stress and thereby reduce its harmful effects (Vallejo et al., 2018).

6. Conclusions

Considering that the effects of stressors on students' health, cognitive functioning and well-being depend on each individual's perception of the situation and the way they are faced, coping is related to coping strategies. Adaptation is necessary to face the demand of a particular stress situation and the resources available to the person to reduce its negative effects and continue functioning physically, psychologically and socially. That is why, based on the above, the functions of coping are the power to regulate emotions in the face of a stressful situation and the adaptation or modification of the person's relationship with the stressful environment, and the coping mechanisms are thoughts and behaviors. That can be variable depending on the triggering situation and the people involved. Given the results obtained in this research, it is proposed to work with students in a preventive health program that generates changes in lifestyles and coping with stressful situations, which help them improve their health and academic performance, as carried out in some international universities that have a preventive mental health program.

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