

# Perceived academic stress in Mexican medical students. The role of sex emotional distress, burnout, academic-social support, current abuse experiences, and coping strategies

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## ABSTRACT

**Introduction.** Academic stress is a common problem among medical students that has a negative physiological, social, and learning impact. Perceived academic stress indicates how stressed a student is about academic issues over a given period of time and the ability to handle that stress. **Objective.** To determine the prevalence of PAS and evaluate possible risk factors, focusing on sex differences, burnout, emotional distress, academic-social support, and coping strategies. **Method.** A cross-sectional, retrospective, and comparative study was conducted through an online survey with medical students (MS) willing to participate anonymously. **Results.** All students reported PAS and the majority to a moderate-severe degree. Comparing the presence of abuse within the academic environment between men and women, we found differences in the frequency of reporting emotional abuse and sexual. Also, we found differences in perceived academic social support from teachers and family members. Multiple logistic regression analysis showed sex and current sexual abuse inside school had the strongest association with PAS in MS, followed by a family history of depression and perceived less academic social support from family. **Discussion and conclusion.** Timely identification of individuals at-risk will be critical to establish preventive strategies to limit the impact of PAS in MS, stress management programs, training coping skills, and offer prompt therapeutic alternatives when needed.

**Keywords:** Perceived academic stress, medical students, emotional distress, burnout, academic-social support, coping strategies.

## RESUMEN

**Introducción.** El estrés académico es un problema común entre los estudiantes de medicina que tiene un impacto negativo a nivel fisiológico, social y de aprendizaje. El estrés académico percibido (PAS) indica lo estresado que está un estudiante por cuestiones académicas durante un periodo de tiempo determinado y la capacidad para manejar ese estrés. **Objetivo.** Determinar la prevalencia del PAS y evaluar los posibles factores de riesgo, centrándose en las diferencias por sexo, burnout, el malestar emocional, el apoyo académico-social y las estrategias de afrontamiento. **Método.** Se realizó un estudio transversal, retrospectivo y comparativo a través de una encuesta en línea con estudiantes de medicina dispuestos a participar de forma anónima. **Resultados.** Todos los estudiantes reportaron PAS y la mayoría en un grado moderado-severo. Comparando la presencia de maltrato dentro del ámbito académico entre hombres y mujeres, encontramos diferencias en la frecuencia de denuncia de maltrato emocional y sexual. Asimismo, encontramos diferencias en el apoyo social académico percibido por parte de docentes y familiares. El análisis de regresión logística múltiple mostró que el sexo y el abuso sexual actual dentro de la escuela tenían la asociación más fuerte con PAS, seguidos por antecedentes familiares de depresión y menos apoyo social académico percibido por parte de la familia. **Discusión y conclusión.** La identificación oportuna de las personas en riesgo será fundamental para establecer estrategias preventivas para limitar el impacto de PAS, programas de manejo del estrés, capacitación en habilidades de afrontamiento y ofrecer alternativas terapéuticas rápidas cuando sea necesario.

**Palabras clave:** Estrés académico percibido, estudiantes de medicina, estrés emocional, burnout, apoyo académico-social, estrategias de afrontamiento, ansiedad, depresión.

## INTRODUCTION

‘Stress’ is a neuroendocrine, immune, and behavioral response of the organism, in the face of any demand that is presented to it (stressor) as a result of an interpretation of threat or danger, allowing the adaptation and survival of the living being (Herman et al., 2016). Perceived stress is defined as a condition or emotion experienced when an imbalance is perceived between the demands of daily life and a person’s ability to respond (result of their personal resources and coping strategies; Wang, Liu, Zhang, Xie, & Yang, 2021; its nature is psychological and subjective induced by the perception and interpretation of facts and experiences. When it arises in the context of an educational process, it is called perceived academic stress (PAS; Aihie & Ohanaka, 2019). Several studies have shown that PAS increases as the student progresses through educational levels (Abdel Wahed & Hassan, 2017; Barbayannis et al., 2022; Dyrbye, Thomas, & Shanafelt, 2006). Going to college is a time of transition and challenge, and students are particularly vulnerable to psychological distress (Gómez-Moliner, Zayas, Ruíz-González, & Guil, 2018).

Undergraduate medical education is a long process in which students face multiple stressors, such as the large amount of information to learn in short periods of time, being in a very competitive environment, constant examinations, the structure of the curriculum design, ethical dilemmas throughout the training, cumulative exams, lack of sleep, violence (internal or external) towards medical students, lack of social support from professors and university, less time to rest and relax, restricted opportunities for social and recreational activities, poor eating practices, fear of failure, self-demand, idealism, dysfunctional defense mechanisms, perfectionist and neurotic traits, academic load, sleep problems, exposure to disease and death of patients, culture and parenting styles (Amir, Dahye, Duane, & Wendy, 2018; Heinen, Bullinger, & Kocalevent, 2017; Hill, Goicochea, & Merlo, 2018; Weber, Skodda, Muth, Angerer, & Loerbroks, 2019). Furthermore, family problems such as lack of social and emotional support and financial instability in the family are associated with stress levels in undergraduate medical students (Bergmann, Muth, & Loerbroks, 2019). Students, throughout their training they encounter factors that threaten their well-being as a highly hierarchical organization and authority figures that sometimes, far from being a positive mentoring, can be a source of abuse and stress (Ng, Lin, & Henning, 2020); Fnais et al. (2014) reported that 59.4% of physicians had experienced at least one form of harassment or discrimination during their training, with verbal harassment being the most frequent form of harassment (63%) followed by gender discrimination (53.6 %). They have been reported to suffer from higher perceived stress compared to undergraduate students from other academic fields (John & Naik, 2020). The high degree

of perceived stress that medical students face requires “a call to action” (Dyrbye & Shanafelt, 2016).

Romo-Nava et al. (2016) reported that during exam season, the prevalence of depression in MS is 16.2%, and that depression is associated with PAS. The consequences of prolonged stress are widespread. Decreased academic performance, substance abuse, and detrimental effects on physical and mental well-being (including psychological distress and burnout) have been reported. Studies focusing on emotional distress as a consequence of prolonged exposure to stressors found an increase in anxiety and depression scores in medical students compared to the general population (Mirza, Baig, Beyari, Halawani, & Mirza, 2021; Philip, Molodynski, Barklie, Bhugra, & Chaturvedi, 2021; Salvagioni et al., 2017). To cope with pressures, students can employ a variety of personal resources (optimism, motivation, self-efficacy) and coping strategies, which may be focused on the problem (planning; asking others for advice) focused on emotions (venting; seeking emotional support from others) or focused on avoidance by nature (denial; alcohol / drug use), which can be classified as adaptive or maladaptive (Collin, O’Selmo, & Whitehead, 2020; Freire, Ferradás, Regueiro, Rodríguez, Valle, & Núñez, 2020; Neufeld & Malin, 2021). Social support is a survival mechanism for stress, since those medical students who are satisfied with their life and with their support network show low perception of stress, adequate coping strategies and high resilience (Ozby et al., 2007). Academic stress can contribute to depression rates in medical students (Alzahrani et al., 2020; Avila-Carrasco et al., 2023; Mirza et al., 2021). Other factors associated with an increased risk to suffer mental health problems are a particularly academically and emotionally demanding training, competitive school environment, constant academic evaluations, the lack of family support, a personal and family history of mental health problems (anxiety, depression, etc.), and gender (Bergmann, Muth, & Loerbroks, 2019; Broks, Stegers-Jager, van der Waal, van den Broek, & Woltman, 2022; Lasheras et al., 2020; Pacheco et al., 2017; Thomas & Bigatti, 2020; Zeng, Chen, Wang, Zhang, & Deng, 2019). It is not known how the levels of perceived academic stress (PAS) and associated factors focusing on academic-social support and coping strategies. Therefore, the aim of the study was to determine the prevalence of PAS and possible risk factors focusing on sex differences, burnout, emotional distress, academic-social support, and coping strategies in a sample of medical students in Mexico.

## METHOD

### Study design and participants

A cross-sectional, retrospective, and comparative study was conducted through an online survey with medical students from the Faculty of Medicine of the Universidad Nacional

Autónoma de México (UNAM), who took part on a voluntary basis and were not remunerated for their participation. The study was conducted from January to December 2020. At the beginning of the online survey, the objectives and procedures of the study were explained, and anonymity of the information was guaranteed. The study was evaluated and approved by the institutional review boards.

## Procedure and instruments

After electronic consent, participants were asked to fill self-report instruments. The first section included questions related to demographic and academic features: current age, sex, marital status, parents' levels of education, if he/she is engaged in a gainful activity (hours per week), type of high school (public or private), school grade and first year of medical studies point average, schedule (morning or afternoon classes), maximum studying hours per day. Afterwards, *SISCO inventory of academic stress* (SISCO-AS; Prochaska, Sung, Max, Shi, & Ong, 2012) is a measure of academic stress in students of upper education or postgraduates. Consists of 31 items on a 5-point Likert type scale (anchored by 1-never to 5-always) including three broad factors: stressors (intensity of academic stress and frequency of academic demands considered as stressful stimulus), symptoms (frequency of reactions to stressful stimulus), and coping (frequency with which coping strategies are used). The section "Symptoms to stressor stimulus" was omitted due to the doubt in discriminative validity generated by the presence of a strong correlation between physical, psychological, and behavioral reactions and due to possible collinearity with depressive symptoms. The Coping subscale had already been described by Barraza, with lower reliability ( $\alpha$  Cronbach = .69; Barraza, 2007), as well as Guzmán-Castillo ( $\alpha$  Cronbach = .45; Guzmán-Castillo, Bustos, Zavala, & Castillo-Navarrete, 2022) and ( $\alpha$  Cronbach = .45, Omega total = .48; Guzmán-Castillo et al., 2022). Coping, as a multidimensional construct, is dynamic, and therefore difficult to measure adequately with six questions; therefore, we opted for a psychometric instrument specifically aimed at its measurement. For the present study, the variable "perceived academic stress" was built with the average score of the section "Demands of the environment", which showed an internal consistent Cronbach's alpha reliability of .90 in undergraduate Mexican students (Romo-Nava et al., 2016; 2019). The level of PAS categories (mild, moderate, and severe) was built according to the 33 and 66 percentiles of the study population. The Maslach Burnout Inventory-Student Survey (MBI-SS; Vega-Valero, Gómez-Escobar, Rodríguez-Hernández, & Gálvez-Jaramillo, 2017) is an instrument that allows identifying the three dimensions of the burnout syndrome: emotional exhaustion, cynicism, and ineffectiveness. It consists of 15 questions with a Likert-type measurement scale from 0 to 6 points that allow classifying the dimensions of the scale into four levels (no «burnout»,

«mild burnout», «moderate burnout», «high burnout»). Banda Guzmán, Robles Francia, and Lussier (2021) performed the validation in Mexican students, the factor analysis supports the validity in the use of the MBI-SS. The Cronbach's alphas obtained were .856 for Emotional Exhaustion, .851 for Cynicism and .717 for Emotional Exhaustion, .851 for Cynicism and .717 for Academic Efficacy. Kessler's K-6 scale (Kessler et al., 2003) is a very brief screening tool for nonspecific psychological distress in adults, six items assess the frequency on psychological distress referring to symptoms of anxiety and depression in the last month. The responses range from "none of the time" coded zero to "all of the time" coded four. The K6 has been adopted widely since its inclusion in the World Health Organization World Mental Health Survey Initiative and translated and validated in several countries including Mexico (Kessler et al., 2010). Academic Social Support Inventory (IASA; Azzahra & Paramita, 2019). Instrument of 80 items, validated in Mexican university students and created by Vega-Valero et al. (2017). It was divided into two sections, the first directed to Perceived Social Support (PSS) and the second to Received Social Support (RSS), likewise, each section evaluates four different areas of support (by peers, teachers, family, and institution). The PSS factor is conformed by peers ( $\alpha = .85$ ), teachers ( $\alpha = .88$ ), family ( $\alpha = .86$ ), and institution ( $\alpha = .70$ ). The second factor, RSS, is made up of peers ( $\alpha = .80$ ), teachers ( $\alpha = .82$ ), family ( $\alpha = .85$ ), and institution ( $\alpha = .81$ ). Likert-type scale from 1 (strongly disagree) to 6 (strongly agree). The Ways of Coping Questionnaire (WCQ; Bacchi & Licinio, 2017), a 66-item questionnaire (on a 4-point Likert scale; 0 = does not apply/or not used; 1 = used somewhat; 2 = used quite a bit; 3 = use a great deal) developed to tap into two main types of coping: emotion-focused and problem-focused coping. There are eight empirically derived subscales of coping: confronting, distancing, self-controlling, seeking support, accepting responsibility, escape-avoidance, planful problem-solving, and positive reappraisal, validated the questionnaire in the Mexican population with a Cronbach's alpha of .90 (Sotelo Arias & Maupome Santillán, 1999). Current physical, emotional, and sexual abuse outside and inside the academic context were also assessed by questions like: Are you currently a victim of abuse/mistreatment outside of school? And are you a victim of abuse/mistreatment inside the school? In case the answers to these questions were positive, the form included examples of the different types of abuse being assessed.

## Statistical analysis

Descriptive information was described as means  $\pm$  standard deviation (SD) as continuous variables and categorical variables were presented by frequencies and percentages. Women were compared to men in terms of demographic variables

Table 1

*Sociodemographic data, perceived academic stress, emotional distress, burnout, academic-social support, current abuse experiences, and coping strategies of the study sample*

		Total (n = 210)	Men (n = 90)	Women (n = 120)		
		n (%)	n (%)	n (%)	p	
Demographic features	Age - years (mean; SD)	19.8 (1.09)	19.9 (1.18)	19.6 (1.01)	.51	
	Marital status - Single	203 (96.6)	87 (96.6)	116 (96.6)	1	
	Mother's schooling - years (mean; SD)	12.08 (7.28)	12.8 (7.41)	11.52 (7.16)	1	
	Father's schooling - years (mean; SD)	13.53 (4.71)	13.5 (4.43)	13.4 (4.92)	.24	
	Cohabitants (Others)	8 (3.8)	3 (3.3)	5 (4.16)	.75	
	Financial resources (Restricted to scarce)	74 (35.2)	31 (34.4)	43 (35.8)	.83	
Family and/or personal history of mental illness	Personal history of depression - positive	87 (41.4)	29 (32.2)	58 (48.3)	.004	
	Personal history of suicide attempt - positive	22 (10.5)	12 (13.3)	10 (8.3)	.862	
	Family history of depression - positive	101 (48.1)	33 (36.6)	68 (56.6)	.019	
	Family history of suicide attempt - positive	29 (13.8)	12 (13.3)	17 (14.2)	.242	
Study variables	Current abuse inside academic setting - Positive	111 (52.8)	43 (47.7)	68 (56.6)	.202	
	Emotional - Positive	64 (30.5)	18 (20)	46 (38.3)	.004	
	Physical - Positive	53 (25.2)	27 (30)	26 (21.6)	.169	
	Sexual - Positive	23 (10.9)	2 (2.2)	21 (17.5)	< .001	
	Ways of Coping Questionnaire (mean; SD)	59.7 (16.7)	62.3 (15.4)	57.7 (17.5)	.049	
	Coping flexibility	22.5 (7.06)	23.9 (6.1)	21.5 (7.5)	.011	
	Positive directed coping	21 (7.31)	21.2 (6.8)	20.8 (7.7)	.72	
	Magical thinking	12.1 (5.36)	12 (4.8)	12.1 (5.7)	.859	
	Distancing	9.59 (3.8)	10.2 (3.1)	9.2 (4.2)	.040	
	Problem-directed coping	12.8 (5.4)	13.5 (5.5)	12.4 (5.2)	.042	
	Positive reassessment	6 (3.01)	6.2 (3.6)	5.8 (2.9)	.185	
	Burnout (MBI-SS) - positive (mean; SD)	54.8 (19.06)	56.8 (19.01)	53.3 (19.05)	.186	
	MBI Depersonalization	3.33 (3.09)	4.4 (2.93)	2.9 (2.96)	< .001	
	MBI Emotional exhaustion	28.7 (17.8)	30.1 (17.6)	27.7 (17.8)	.325	
	MBI personal accomplishment	22.5 (6.22)	22.2 (6.06)	22.7 (6.35)	.574	
	Kessler Psychological Distress Scale (mean; SD)	16.62 (3.86)	15.12 (3.82)	17.75 (3.51)	< .001	
	Nervous	3.03 (1.18)	2.94 (1.27)	3.10 (1.11)	.323	
	Hopeless	2.73 (1.12)	2.42 (1.18)	2.97 (1.02)	< .001	
	Restless or Fidgety	2.64 (1.03)	2.47 (1.04)	2.76 (1.01)	.044	
	Depression	2.83 (1.01)	2.51 (1.12)	3.07 (.86)	< .001	
	Everything was an effort	2.49 (1.12)	2.01 (1.07)	2.86 (1.02)	< .001	
	Worthless	2.87 (.89)	2.76 (.96)	2.95 (.84)	.126	
	Perceived academic stress-(mean; SD)	50.4 (10.4)	48.1 (8.02)	52.09 (11.5)	.005	
	Competitiveness with classmates	3.2 (1.24)	2.9 (1.24)	3.4 (1.19)	.006	
	Schoolwork overload	2.3 (1.12)	2.1 (1.13)	2.5 (1.07)	.005	
	Teacher's character and personality	2.4 (1.14)	1.9 (1.02)	2.7 (1.11)	< .001	
	Teachers' evaluations	2.4 (1.20)	1.9 (1.04)	2.7 (1.20)	< .001	
	Type of Schoolwork requested by teachers	2.3 (1.13)	1.9 (.97)	2.7 (1.11)	< .001	
	Misunderstanding class topics	2.5 (1.15)	2.2 (1.1)	2.7 (1.17)	.001	
	Participation in class	2.3 (1.18)	1.8 (.97)	2.7 (1.19)	< .001	
	Time to complete Schoolwork	2.4 (1.11)	2 (1)	2.6 (1.13)	< .001	
	Academic Social Support Inventory (IASA)	Perceived Social Support				
		Companions - Moderate	100 (47.6)	43 (47.7)	57 (47.5)	.968
Teachers - Moderate		51 (24.3)	39 (43.3)	12 (10)	< .001	
Family - Moderate		41 (19.5)	26 (28.8)	15 (12.5)	.003	
Institution - Moderate		19 (9)	6 (6.6)	13 (10.8)	.298	
Social Support Received						
Companions - moderate		67 (31.9)	32 (35.5)	35 (29.1)	.326	
Teachers - moderate		32 (15.2)	18 (20)	14 (11.6)	.224	
Family - moderate	45 (21.4)	19 (21.1)	26 (21.6)	.939		
Institution - moderate	4 (1.9)	3 (3.3)	1 (8)	.293		

(age, marital status, cohabitants, and financial resources) and clinical variables (current abuse, personal history of mental illness, family history of mental illness, emotional distress, burnout, academic-social support, and coping strategies). Categorical variables were compared between men and women using chi-square tests ( $X^2$ ), and independent sample Student's  $t$  test, as well as the comparison of their items through the Mann–Whitney  $U$  test, were used to compare SISCO scores. PAS levels (SISCO scores) were dichotomized into mild (below the 33rd percentile) and moderate-severe (above the 33rd percentile) for logistic regression. Pearson coefficient was used to evaluate the correlation between MBI-SS, IASA, WCQ and perceived academic stress (SISCO scores). Simple logistic regression analysis was conducted to evaluate the association between PAS as a dependent variable and possible associated factors as independent variables. Variables showing a statistically significant association with PAS were then used in a backward elimination (conditional) multiple logistic regression model to evaluate their relationship with PAS. The estimation of the effect of the explanatory variable (PAS) was expressed by estimating the odds ratio (OR) adjusted for other factors included in the model as covariates, with a 95% confidence interval (95% CI). All analyses were performed using SPSS Statistics V 25.0. The significance level for all tests was established at  $P < .05$ .

### Ethical considerations

The present study was approved by the Ethics and Research Committees (National University of Mexico UNAM - IN309920) and that consent to participate could be withdrawn at any time by dropping out of the survey. The study was conducted according with the Helsinki Declaration as revised 1989. All subjects voluntarily signed electronic consent to participate after receiving a comprehensive explanation of the nature of the study. Students identified at-risk according to MBI-SS, Kessler's K-6 scale and/or current abuse inside school, were invited to a more in-depth evaluation to offer specialized attention if needed.

## RESULTS

210 medical students were recruited, 57% ( $n = 120$ ) were women, with a mean age of 19.8 ( $SD \pm 1.09$ ) years. Most participants were single (96.6%,  $n = 203$ ), cohabited with their family (96.2%,  $n = 202$ ), and received sufficient financial resources for costs of living (64.8%,  $n = 136$ ). All students reported perceived academic stress, the majority a moderate degree (64.16%,  $n = 77$ ; Table 1). In addition, 41.4% ( $n = 87$ ) referred a personal history of depression, and 48.1% ( $n = 101$ ) had a family history of depression.

Burnout was reported by all students, with the majority with a moderate degree (69%,  $n = 145$ ). About 52.9% ( $n =$

111) refer at least one type of violence within the school environment, verbal violence being the most frequent (30.5%), followed by physical (25.2%) and sexual (11%). Also, 47% ( $n = 100$ ) perceived moderate academic social support from their peers, followed by teachers (24.3%,  $n = 51$ ) and family members (19.5%,  $n = 41$ ). Regarding social support received, 31.9% ( $n = 67$ ) referred a moderate increase by peers, followed by relatives (21.4%,  $n = 45$ ) and teachers (15.2%,  $n = 32$ ). As seen in Table 1, similar demographic features were found between men and women. (Table 1). Regarding family and / or personal history of mental illness, differences were found between men and women regarding family (32.2% vs. 48.3%,  $p = .004$ ) and personal history of depression (36.6% vs. 56.6%,  $p = .019$ ). Comparing the presence of abuse within the academic environment between men and women, differences were found in the frequency of reporting emotional abuse (20% vs. 38.3%,  $p = .004$ ) and sexual (2.2% vs. 17.5%,  $p \leq .001$ ). Mean item and total scores on Kessler Psychological Distress Scale were higher among females compared to males except for nervous and worthless. The comparison between the types of stressors described in the SISCO show that women scored higher on all perceived academic stress items compared to men. At the IASA. Differences were found in moderate perceived academic social support from teachers (men = 43.3% vs. women = 10%,  $p \leq .001$ ) and family members (men = 28.5% vs. 12.5%,  $p = .003$ ). Also, we did not find differences in social support received (Table 1).

The total score and the types of stressors described in the SISCO show that women scored higher on all perceived academic stress items compared to men.

Correlation analysis showed that the total score on the SISCO scale, and therefore of the perception of academic stress, increases while the total score on the WCQ scale (lower coping strategies), perception of academic social support from teachers and family decreases (Table 2).

Simple linear regression analysis showed a significant association between PAS scores and variables such as being a woman (OR = 3.25, IC 95% = [1.08, 9.5],  $p = .004$ ), father's scholar years (OR = 1.065, IC 95% = [1.015, 1.117],  $p = .010$ ), family history of depression (OR = 1.943, IC

Table 2  
Pearson's correlation coefficients between WCQ, SISCO, MBI-SS, PSS (teachers and family)

	WCQ	SISCO	MBI-SS	PSS (Teachers)	PSS (Family)
WCQ					
SISCO	-.481**				
MBI-SS	-.098	.075			
PSS (teachers)	.357**	-.475**	-.124		
PSS (family)	.398**	-.424**	-.170*	.712**	

Note: PSS = Perceived Social Support.  
\*\* The correlation is significant at the .01 level (bilateral).  
\* The correlation is significant at the .05 level (bilateral).

95% = [1.09, 3.4],  $p = .023$ ), current emotional abuse (OR = 1.064, IC 95% = [1.022, 1.108],  $p = .003$ ), problem-directed coping (OR = .867, IC 95% [.807,.932],  $p \leq .001$ ), positive reassessment (OR = .834, IC 95% = [.730, .950],  $p \leq .001$ ), perceived Mild Social Support from Companions (OR = 2.972, IC 95% = [1.350, 6.54],  $p = .007$ ), Teach-

ers (OR = 3.012, IC 95% = [1.210, 7.496],  $P = .018$ ) and Family (OR = 3.37, IC 95% = [1.179, 9.58],  $p = .023$ ) and received Mild Social Support from family (OR = 3.358, IC 95% = [1.365, 10.2],  $p = .010$ ; Table 3).

A multiple logistic regression analysis model was constructed using the variables with a significant association

**Table 3**  
Simple logistic regression analysis of sociodemographic and clinical characteristics associated with perceived academic stress in medical students

Risk factor		Criteria for PAS		OR	95% CI	p
		Mild	Moderate/Severe			
		n (%)	n (%)			
Demographic features	Sex. Women n (%)	38 (31.7)	81 (68.3)	3.25	1.08-9.5	.004
	Age - years (mean; SD)	19.8 (1.07)	19.7 (1.11)	.902	.692-1.17	.448
	Marital status - Single	70 (34.5)	133 (65.5)	1.32	.264-6.63	.733
	Mother's schooling - years (mean; SD)	12.08 (7.28)	12.8 (7.41)	.98	.922-1.057	.711
	Father's schooling -years (mean; SD)	10.26 (7.12)	13.1 (7.17)	1.065	1.015-1.117	.010
	Cohabitants. Negative n (%)	71 (35.1)	131 (64.9)	2.70	.498-14.67	.249
	Financial resources (Restricted to scarce)	46 (33.8)	91 (66.2)	.783	.414-1.479	.451
Family and/or personal history of mental illness	Personal history of depression- positive	33 (37.9)	54 (62.1)	1.943	1.09-3.43	.023
	Personal history of suicide attempt -positive	3 (13.6)	19 (86.4)	.512	.198-1.22	.164
	Family history of depression- positive	43 (42.6)	58 (57.4)	1.067	.563-2.02	.843
	Family history of suicide attempt- positive	13 (44.8)	16 (55.2)	1.398	.611-3.19	.428
Study variables	Current abuse inside academic setting – Positive	40 (52.8)	71 (64)	.642	.253-1.627	.350
	Emotional - Positive	22 (34.4)	42 (65.6)	1.064	1.022-1.108	.003
	Physical - Positive	18 (34)	35 (66)	1.75	.755-4.060	.192
	Sexual - Positive	7 (30.4)	16 (69.6)	.907	.325-2.52	.851
	Ways of Coping Questionnaire (mean; SD)	66.7 (14.3)	56.1 (16.8)	.962	.853-1.086	.532
	Coping flexibility	22.9 (7.45)	22.3 (6.88)	1.031	.965-1.102	.191
	Positive directed coping	21.6 (6.24)	20.6 (7.8)	1.023	.887-1.179	.756
	Magical thinking	12.1 (4.73)	12.08 (5.6)	1.52	.911-1.215	.487
	Distancing	9.54 (3.8)	9.6 (3.8)	.974	.806-1.176	.782
	Problem-directed coping	15.95 (6.1)	8.99 (6.7)	.867	.807-.932	< .001
	Positive reassessment	7.1 (2.94)	4.9 (3.2)	.834	.730-.950	< .001
	Burnout (MBI-SS) - positive (mean; SD)					
	MBI. Depersonalization	3.87 (3.3)	3.41 (2.88)	.909	.776-1.065	.240
	MBI. Emotional exhaustion	30.7 (15.5)	27.7 (18.7)	1	.974-1.027	.979
	MBI. personal accomplishment	22.6 (4.61)	22.4 (6.91)	.983	.929-1.040	.548
	Kessler Psychological Distress Scale (mean; SD)					
	Nervous	3.05 (1.06)	3.02 (1.24)	1.025	.699-1.503	.90
	Hopeless	2.47 (.98)	2.87 (1.17)	1.225	.813-1.845	.33
	Restless or Fidgety	2.53 (1.13)	2.69 (.97)	1.453	.896-.355	.13
	Depression	2.70 (1.11)	2.89 (.96)	.71	.434-1.1865	.19
Everything was an effort	2.59 (1.10)	2.44 (1.14)	.895	.580-1.382	.61	
Worthless	2.92 (.89)	2.84 (.90)	1.288	.790-2.101	.31	
Academic Social Support Inventory (IASA)	Perceived Social Support					
	Companions - Mild	47 (42.7)	63 (57.3)	2.972	1.350-6.546	.007
	Teachers - Mild	59 (38.6)	94 (61.4)	3.012	1.210-7.496	.018
	Family - Mild	65 (38.5)	104 (61.5)	3.358	1.179-9.58	.023
	Institution - Mild	70 (36.6)	121 (63.4)	3.403	.799-14.496	.098
	Social Support Received n (%)					
	Companions - Mild	49 (34.3)	94 (65.7)	1.161	.450-2.995	.758
	Teachers - Mild	58 (33.7)	114 (66.3)	.648	.251-1.672	.370
	Family - Mild	65 (40.1)	97 (59.9)	3.376	1.365-10.22	.010
	Institution - Mild	67 (32.7)	138 (67.3)	.653	.254-1.68	.981

to an increased risk for perceived academic stress. In this multivariate model, a significant association to an increased risk for current perceived academic stress remained in the following factors: sex (OR = 2.94,  $p = .03$ ), problem-directed coping (OR = .814,  $p = .001$ ), positive reassessment (OR = .765,  $p = .001$ ), perceived Mild Social Support from Companions (OR = 2.88  $p = .011$ ), Teachers (OR = 2.68,  $p = .040$ ) and Family (OR = 3.18,  $p = .040$ ) and received Mild Social Support from family (OR = 4.2,  $p = .006$ ; Table 3).

## DISCUSSION AND CONCLUSION

In the present study, two main findings emerged: 1. being a woman, a family history of depression coping strategies (WCQ; problem-directed coping and positive reassessment) and perceived academic social support from companions, teachers and/or family correlates with perceived academic stress, and 2. women reported: higher levels of PAS and subscales, emotional distress, current emotional and sexual abuse inside the academic setting, a family history of depression, as well as less perceived social support from family and teachers.

Medical students reported higher levels of academic stress, which plays an important role in the overall mental health and academic performance of medical students, they showed more signs of stress, anxiety, and depression than other university students (Liu & Cao, 2022). The isolation experienced by medical students occurs from the moment they enter medical school, as educational demands prevent them from maintaining the family, social roles, and social relationships they had outside of medicine up to that point. Isolation also breaks with the ordinary spheres of life: sleep, work, and recreation, where everything converges in the same physical space, always in the company of the same people and under a hierarchical organization that imposes rigid schedules and plans.

Social support is the perception and/or actuality of being cared, receiving assistance from a teacher, family member and a college, and belonging to a supportive social environment. The supportive resources can be emotional, verbal, tangible, or companionship. In a stressful situation, social support is a survival mechanism (Kim, Jee, Lee, An, & Lee, 2018), since those medical students who are satisfied with their life and with their support network show low perception of stress, adequate coping strategies and high resilience (Kilic, Nasello, Melchior, & Triffaux, 2021; Liu & Cao, 2022; Torales, Barrios, Samudio, & Samudio, 2018; Ulupinar & Tayfur, 2016). Low social support is related to high perceived academic stress, poor academic self-perception, as well as mental health problems among medical students (Kim et al., 2018; Shao et al., 2020; Torales et al., 2018; Ulupinar, & Tayfur, 2016). Like stress, insufficient social support could continue after the qualification of these already graduate stu-

dents as physicians, potentially affecting their future clinical practice and reduced positive emotion and experience and lessened psychological well-being of medical students.

Similarly, female medical students display significantly higher values for perceived stress levels, with more females indicated more moderate levels of stress compared to their male counterparts. Being a female has been positively associated with PAS, similar to our findings (Castro & Villanueva Lozano, 2018; Graves, Hall, Dias-Karch, Haischer, & Apter, 2021). Women experience difficulties achieving their goals in a world dominated by men. Several researchers have corroborated the increased pressure on the medical curriculum, especially academic achievement. The numerical increase of women in medical schools has not significantly improved their position, which can be attributed to the highly hierarchical and androcentric nature of the medical field (Castro & Villanueva Lozano, 2018; Fnais et al., 2014). These hierarchical relationships are manifested in discrimination and violence against women, which persists openly as part of the university culture, for example, through the manifest rejection of some professors who still consider that women should remain in the domestic space and take care of the family, for which they experience throughout their professional lives the constant need to demonstrate their academic ability to their peers and teachers (Fnais et al., 2014; Graves, Hall, Dias-Karch, Haischer, & Apter, 2021). Our results showed that women students have a significant inclination towards academic stress compared to men. However, despite that, the stress conditions have negative consequences for both genders; women generally tend to feel pressured by their academic environment, family, and social environment.

At the same time, stress during medical training drives medical students to develop certain skills, resources, and strategies to cope with these situations, a phenomenon known as coping. Coping strategies play an important role and may contribute to the variability of responses among individuals facing similar sources of stress. Students who utilize maladaptive coping usually would not deal with their problems in a constructive manner. Although maladaptive coping may temporarily suppress stressful situations and distract students from the sources of stress, it could eventually lead to emotional distress.

This study presents several limits. First, our findings were derived from a cross-sectional and correlational design, and, therefore, our interpretations do not represent causal inferences. Second, our participation rate might also limit the generalizability of our results. Third, we collected self-reported measures and cannot exclude bias associated with self-assessment, such as social desirability.

Despite the limitations above, this study was conducted to resolve the issue of the lack of comprehensive empirical support of the prevalence of PAS and to evaluate gender differences in the association between demographic features,

burnout, emotional distress, academic-social support, and coping strategies with PAS. Focusing on current abuse experiences suffered inside the academic setting.

Mental health interventions should be included in the crisis response by destigmatizing mental health problems, encouraging communication, and providing psychological support. Quarantined medical students should be initiated on coping skills and stress management techniques, while opportunities for personal and curricular development should be provided.

The findings point to the crucial need for stress management programs and training in coping skills in medical students. Special attention is required in the design, planning and evaluation of the curriculum with a gender perspective. Educative settings should prevent students from stress by planning brief periods of acute stress rather than a long period of stress.

It is essential to generate public policies that denature and evidence violence. It is necessary to create specialized and reliable centers for the complaint that support the student body with effective solutions that ensure confidentiality without fear of reprisals, and thus be able to make visible the magnitude and significance of the problem. To increase confidence in the university's fight against abuse, it is necessary to implement university policies and actions against bullying and abuse in general (for example, posting policies on the front page of the university's website, displaying folders and posters on this topic at the university, announcing activities on this subject, training university staff in non-humiliating ways to teach students).

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## Conflict of interest

The authors declare they have no conflicts of interest.

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