

**Title:** Burnout Among First-Year Medical Students During COVID-19 Pandemic in Mexico: A Cross-sectional Study.

**Author names:**

1. Sofía Jezzini-Martinez
2. Javier Humberto Martinez-Garza
3. Alejandro Quiroga-Garza
4. Pablo Patricio Zarate-Garza
5. Guillermo Jacobo-Baca
6. Jorge Gutierrez-De la O
7. David de la Fuente-Villarreal
8. Yolanda Salinas-Alvarez
9. Rodrigo Enrique Elizondo-Omaña
10. Santos Guzman-Lopez\*

**Degrees and Affiliations:**

1. Fourth-year Medical Student, Department of Human Anatomy, School of Medicine, Universidad Autónoma de Nuevo León, Monterrey, Mexico.
2. MD. PhD. Universidad Autónoma de Nuevo León, Monterrey, Mexico.
3. MD. PhD. Universidad Autónoma de Nuevo León, Monterrey, Mexico.
4. MD. PhD. Universidad Autónoma de Nuevo León, Monterrey, Mexico.
5. MD. PhD. Universidad Autónoma de Nuevo León, Monterrey, Mexico.
6. MD. Universidad Autónoma de Nuevo León, Monterrey, Mexico.
7. MD. PhD. Universidad Autónoma de Nuevo León, Monterrey, Mexico.
8. MD. Universidad Autónoma de Nuevo León, Monterrey, Mexico.
9. MD. PhD. Universidad Autónoma de Nuevo León, Monterrey, Mexico.
10. MD. PhD. Universidad Autónoma de Nuevo León, Monterrey, Mexico.

**ORCID (Open Researcher and Contributor Identifier):**

1. (0000-0001-8932-4818)
2. (0000-0002-8498-6908)
3. (0000-0002-5398-247X)
4. (0000-0001-5323-6701)
5. (0000-0003-3271-8781)
6. (0000-0002-4372-061X)
7. (0000-0002-5448-9361)
8. (0000-0003-4772-1895)
9. (0000-0002-8017-2640)
10. (0000-0003-4100-1360)

**About the author:** Sofía Jezzini-Martínez is a fourth-year medical student of a six-year program. She is member of the anatomy research group in the Department of Human Anatomy, School of Medicine at the Universidad Autónoma de Nuevo León, Monterrey, Nuevo León, México. She currently works on several research projects oriented towards bone and joint anatomy, and medical education.

1 **Corresponding author email:** pattyg19@gmail.com

2 **Acknowledgment:** None.

3 **Financing:** None.

4 **Conflict of interest statement by authors:** No financial or business profit was obtained through this study. All  
5 authors declare no conflicts of interest.

6 **Compliance with ethical standards:** The study was approved by the University's ethics and research  
7 committees with the registration number AH20-0003.

8 **Authors Contribution Statement:**

Contributor Role	Role Definition	Authors												
		1	2	3	4	5	6	7	8	9	10			
<b>Conceptualization</b>	Ideas; formulation or evolution of overarching research goals and aims.	X		X										
<b>Data Curation</b>	Management activities to annotate (produce metadata), scrub data and maintain research data (including software code, where it is necessary for interpreting the data itself) for initial use and later reuse.	X	X	X										
<b>Formal Analysis</b>	Application of statistical, mathematical, computational, or other formal techniques to analyze or synthesize study data.	X												
<b>Funding Acquisition</b>	Acquisition of the financial support for the project leading to this publication.	X	X	X	X	X	X	X	X	X	X	X	X	X
<b>Investigation</b>	Conducting a research and investigation process, specifically performing the experiments, or data/evidence collection.	X		X			X							
<b>Methodology</b>	Development or design of methodology; creation of models	X		X										
<b>Project Administration</b>	Management and coordination responsibility for the research activity planning and execution.			X					X			X	X	
<b>Resources</b>	Provision of study materials, reagents, materials, patients, laboratory samples, animals, instrumentation, computing resources, or other analysis tools.		X	X	X		X	X	X					X
<b>Software</b>	Programming, software development; designing computer programs; implementation of the computer code and supporting algorithms; testing of existing code components.	X												
<b>Supervision</b>	Oversight and leadership responsibility for the research activity planning and execution, including mentorship external to the core team.		X	X	X	X	X	X	X	X	X	X	X	X
<b>Validation</b>	Verification, whether as a part of the activity or separate, of the overall replication/reproducibility of results/experiments and other research outputs.		X		X	X	X	X	X	X	X	X	X	X
<b>Visualization</b>	Preparation, creation and/or presentation of the published work, specifically visualization/data presentation.	X	X	X	X	X	X	X	X	X	X	X	X	X
<b>Writing Original Draft Preparation</b>	Creation and/or presentation of the published work, specifically writing the initial draft (including substantive translation).	X		X										
<b>Writing Review &amp; Editing</b>	Preparation, creation and/or presentation of the published work by those from the original research group, specifically critical review, commentary or revision – including pre- or post-publication stages.	X		X										

9

10 **Manuscript word count:** 2020

11 **Abstract word count:** 212

12 **Number of Figures and Tables:** 2 Tables, 1 Figure

13 **Personal, Professional, and Institutional Social Network accounts.**

- 14 • **Facebook:** GIA UANL
- 15 • **Twitter:** @gia\_uanl, @sofijezzini, @DrAlejandroQui1

16

17 **Discussion Points:**

- 18 1. The COVID-19 pandemic has affected the psychological health of medical students.
- 19 2. Burnout was identified in 14.9% of first-year medical students.
- 20 3. High emotional exhaustion was evident in 53.9%, and more occurred more often likely in men.
- 21 4. Schools should consider making available and promoting mental health programs and making available  
22 for their students.

23

24

1 **Dates**

2 Submission: 07/28/2021

3 Revisions: 08/23/2021, 10/09/2021, 01/12/2022

4 Responses: 09/10/2021, 10/13/2021, 02/02/2022

5 Acceptance: 02/15/2022

6 Publication: 02/16/2022

7

8 **Editors**

9 Associate Editor/Editor: Francisco J. Bonilla-Escobar

10 Student Editors: Benjamin Liu, Michael Tavolieri & Muhammad Romail Manan

11 Copyeditor: Pierre Elnazir

12 Proofreader:

13 Layout Editor:

14

15 **Publisher's Disclosure:** *This is a PDF file of an unedited manuscript that has been accepted for publication.*

16 *As a service to our readers and authors we are providing this early version of the manuscript. The manuscript*

17 *will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable*

18 *form. Please note that during the production process error*

19

Accepted, in press

1 **ABSTRACT.**

2

3 **Background:** The coronavirus pandemic is an international public health emergency without precedence in  
4 modern history. It represents a challenge to the academic and psychological stability of students due to the  
5 changes it can cause in daily life. This study aimed to evaluate the prevalence and level of burnout in medical  
6 students caused by the academic and psychological instability that the pandemic represents.

7

8 **Methods:** A cross-sectional prospective study was designed using the Maslach Burnout Inventory-Student  
9 Survey (MBI-SS). This evaluated the emotional exhaustion due to study demands, cynicism, and negative  
10 self-academic efficacy. This study was based in the school of medicine of the Universidad Autonoma de  
11 Nuevo Leon (UANL), in Monterrey, Mexico during the Spring semester 2020.

12

13 **Results:** A total of 154 (93 women and 61 men) first-year medical students participated (response rate  
14 36.4%). Burnout was identified in 14.9% (n=23), and high emotional exhaustion in 53.9% (n=83). Burnout was  
15 almost 4 times more likely to develop in men than in women (aOR = 4.8; 95% Confidence Interval=1.7-13.3)  
16 when considering age as a covariable in the multivariable model.

17

18 **Conclusion:** Further epidemiological studies of burnout syndrome in medical students are needed, and  
19 schools should consider promoting mental health and making programs available for their students to help  
20 overcome the emotional and social challenges during the pandemic.

21

22 **Key Words:** Psychological burnout, COVID-19, Pandemic, Medical students.

23

Accepted, in press

## 1 INTRODUCTION.

2

3 Burnout is a psychological syndrome produced by professional exhaustion and chronic stress based on three  
4 main domains: excess emotional exhaustion, excessive depersonalization, and reduced personal  
5 achievement.<sup>1</sup> In the academic context, the three main domains that evaluate the presence of burnout  
6 syndrome are emotional exhaustion, cynicism, and self-academic efficacy. Emotional exhaustion refers to  
7 feelings of being overextended and depleted of one's emotional resources. Cynicism is a cynical detached  
8 response to other people and themselves. Negative self-academic efficacy evaluates a reduction in personal  
9 accomplishment and feeling less competent in their academic performance.<sup>2-3</sup> The Maslach Burnout Inventory  
10 has been the most used instrument in the scientific community to evaluate burnout syndrome in the general  
11 population and the General Survey version (MBI-GS) was designed as an instrument to assess burnout in  
12 work contexts.<sup>4-5</sup> Based on the assumption that students experience an equivalent form of exhaustion, the  
13 MBI-GS was adapted to survey university students, creating the Maslach Burnout Inventory-Student Survey  
14 (MBI-SS).<sup>6</sup> The application of the MBI-SS shows students can experience high levels of emotional exhaustion,  
15 depersonalization or cynicism, and negative self-academic efficacy. Each domain assesses different  
16 symptoms and conducts.

17

18 During the last years, burnout has increased its incidence as a common phenomenon among medical  
19 students, residents, and doctors with less than 5 years of experience in comparison to the general  
20 population.<sup>7</sup> Recent observations suggest the appearance of burnout during the first years of medicine has  
21 increased,<sup>8</sup> and that at least half of the students will suffer burnout at some point in their medical studies.<sup>3,9</sup>  
22 These high statistics suggest that the evaluation of burnout syndrome is important in medical students.  
23 Addressing the problem at the right time can improve their academic performance and reduce the risk of  
24 developing further emotional instability, fatigue, and drug use.<sup>10-11</sup>

25

26 The SARS-COV-2 pandemic, also known as COVID-19, has changed completely the way the population lives  
27 around the world. From the mandatory self-isolation time and use of face masks, to a forced transition from  
28 face-to-face education to online platforms, changing the environment in which educators and students  
29 interact.<sup>12</sup> These sudden outbreaks can precipitate new psychiatric symptoms and aggravate pre-existing  
30 mental illnesses.<sup>13</sup> During today's pandemic, the general population has reported an increase in feelings of  
31 anxiety, depression, post-traumatic stress disorder, obsessive-compulsive disorder, insomnia, and suicide.<sup>13</sup>  
32 Apart from the psychiatric consequences to the general population it has been proved that social isolation has  
33 increased substantially the suicide risk in older people during the pandemic. Understanding the severity of the  
34 problem leads to finding common solutions, such as suicide prevention, dissemination of scientific information,  
35 promoting self-help, positive coping, reducing isolation through technology, and developing telehealth.<sup>14</sup>

36

37 The medical community has suffered an important increase in the amount of work during the COVID-19  
38 pandemic. Several studies have evaluated burnout in physicians during the pandemic, reporting that on  
39 average, 76% of medical residents had reported burnout in these times.<sup>15-16</sup> In contrast to medical residents  
40 and specialists, few have addressed the psychological burden and pressures on students due to the closure  
41 of facilities and schools around the world.<sup>17-19</sup>

1  
2  
3  
4  
5  
6

We hypothesized the students would present high levels of emotional exhaustion and burnout levels because, during the pandemic, the risk of developing COVID-19 and the change in learning methods will accentuate their previous stress. The objective of this study was to evaluate the prevalence and level of burnout in first year medical students during the COVID-19 pandemic.

Accepted, in-press

## MATERIALS OR PATIENTS AND METHODS.

A cross-sectional study was designed to establish the burnout prevalence in first-year medical students; enrolled in the 2020 spring semester of the Human Anatomy course. The ages ranged between 18 and 24 years and the mean age was  $18.9 \pm 0.9$ . The study was based in the school of medicine of the Universidad Autonoma de Nuevo Leon (UANL), in Monterrey, Mexico, which has a 6-year program, and a 19-week anatomy course during the first year.<sup>20</sup>

The eligibility criteria were to be enrolled in the human anatomy course during the pandemic COVID-19 and to be at least 18 years old. The students enrolled in the Gross Gross Human Anatomy course were second-semester medical students and they previously had presential courses last semester. We determined as an estimated sample size that the enrollment of 139 first-year medical students would provide a power of 97.5% to detect the prevalence of burnout at least 10%, using a two-sided test with a type I error of 0.05.

An online survey was advertised on the official website of the human anatomy department during the last week of the spring semester (June 22 to June 26 of 2020). The survey contained an online informant consent where the students had the opportunity to deny their participation in the study or answered voluntarily. The age and sex of the students were collected, then the Maslach Burnout Inventory-Student Survey (MBI-SS)<sup>21-22</sup> was applied, which consisted of 15 questions corresponding to the evaluation of emotional exhaustion (five items), cynicism (four items), and academic efficacy (six items) (Supplement 1). The scores described the frequency with which the student felt identified with each expression, from 0 (never) to 6 (always). Results from the three domains were classified as follows: emotional exhaustion: low (0-9), moderate (10-14), or high (>14); cynicism: low (0-1), moderate (2-6), or high (>6); and academic effectiveness: low (<22), moderate (23-27), or high (>28).<sup>21-22</sup>

Due to the anonymity of the survey, all participants were provided with the information for psychological support through the student mental healthcare programs provided by the University through the Department of Psychiatry of the University Hospital.

Responses from all questionnaires were registered in a database using 2020 Microsoft Excel for Mac, version 16.43 (Microsoft Corp., Redmond, WA). These were then analyzed using SPSS statistical package, version 25.0 (SPSS Inc., Chicago, IL). Quantitative variables were summarized in measures of central tendency and dispersion, and qualitative variables in frequencies and percentages. A student's t-test was used to compare quantitative variables. A Pearson's Chi-Squared test was run and odds ratios (OR) and 95% confidence intervals (CI) were calculated to determine associations in qualitative variables. Adjusted OR (aOR) were calculated after including age as a covariate in a multivariable regression model. Variables with a p-value of <0.05 in the univariate analysis were included in the multivariate. A statistical threshold of <0.05 was used throughout. The study was approved by the University's ethics and research committees with the registration number AH20-0003. No external funding was used. The authors declare no conflicts of interest.

1 **RESULTS.**

2

3 A total of 154 first-year medical students were included on the study, 60.3%(n =93) were female and 39.6%  
4 (n=61) were male (response rate 36.4%). Based on the MBI-SS definition, 14.9% (n=23) of the study  
5 participants were found to have burnout syndrome, 53.9% (n=83) scored high on emotional exhaustion,  
6 16.9% (n=26) scored high cynicism, and 34.4% (n=53) scored low on academic effectiveness (**Table 1,**  
7 **Figure 1**): Men had a statistical tendency towards lower academic effectiveness ( $p=0.037$ ) and increased  
8 cynicism ( $p=0.003$ ) than women, as well as a higher incidence of burnout (26.6% vs 7.5%,  $p=0.001$ ).

9

10 Men were 3 times more likely to develop burnout than women (aOR: 4.3; 95% CI [1.6-11.3]) in the bivariable  
11 analysis and almost 4 times more likely (aOR: 4.8 95% Confidence Interval=1.7-13.3) after adjustment by age  
12 (**Table 2**)

13

Accepted, in-press



**DISCUSSION.**

The coronavirus pandemic caused the need to establish quarantine around the world. Students were forced to transition from face-to-face learning to fully online learning, restrained to their homes, experiencing a constant fear of being infected. Facing these daily-life changes can impact the mental health of the students as well as their academic performance due to the increased amount of stress exposure.

In this cross-sectional study, the burnout prevalence was 14.9% among first-year medical students enrolled in the human anatomy course. There was a high (53.9%) prevalence of emotional exhaustion. Men were more likely to experience lower academic effectiveness, increased cynicism, and burnout levels. Previously studies had addressed burnout syndrome, however, their focus was towards student involvement in clinical scenarios, rather than prevalence. Aebischer et al. (2020) surveyed medical students and residents involved in COVID-19 scenarios and their non-involved peers, to determine levels of anxiety, depression, and burnout. Both medical students and residents reported lower levels of anxiety, depression, and burnout, compared with their non-involved peers.<sup>17</sup> Asencio-Lopez et al. (2016) evaluated the prevalence of burnout among medical students in a Mexican University before the COVID-19 pandemic.<sup>23</sup> They used the MBI questionnaire reporting a lower prevalence of 5.2% for moderate burnout syndrome (vs 14.9% in the present study). Although the study included first to sixth-year students rather than only first-year students, it can be hypothesized that the pandemic is an influencing factor for increased burnout prevalence. Other associated factors involved such as attending university for the first time, living away from home, drug use, among others, should also be considered.

Assessing the prevalence of burnout syndrome in medical students is important because early intervention can prevent the development of future psychiatric disorders. Suffering even from only one of the three domains that make up the syndrome can lead to the appearance of negative effects related to the learning process and physical symptoms such as drowsiness, fatigue, migraine, emotional instability, and even increased alcohol and drug use<sup>12-13</sup>. Son et al. (2020) reported 71% of college students had increased stress, anxiety, and depressive thoughts due to COVID-19 associated with difficulty in concentrating, disruption in sleeping patterns, decreased social interactions, and increased concerns on academic performance.<sup>24</sup> These symptoms have a negative impact on the academic development of the student and their health, serving as a predictive factor for the increased risk of suicide and dropping out of medical studies.<sup>25</sup>

The results of this study demonstrate that at least 14.9% of our medical students are at risk of developing the negative effects that come with burnout syndrome. Bearing in mind participants do not need to have been impacted in all domains of burnout to be at risk for negative impacts. To support these students at the end of the study we provide the information for psychological support through the student mental healthcare programs provided by the University through the Department of Psychiatry of the University Hospital.

The main limitation of this study was that it did not evaluate associated factors that may cause burnout symptoms such as drug or alcohol consumption, cigarette smoking, economic or family status, stress, poor peer interactions and support, lower levels of physical activities, among others. There is a lack of a control

1 group (prior to the pandemic), therefore the high prevalence of burnout can only be hypothesized as due to  
2 the pandemic but cannot be objectively shown. The survey was only answered by 154 students enrolled in the  
3 human anatomy course of more than 500. The mean age (18.9 years) is younger than other medical schools,  
4 and maturity may also influence the prevalence.

5 Although the University already has psychological support made available through the student mental  
6 healthcare programs, accessing these may present a challenge. The programs were designed for face-to-face  
7 interaction with trained psychologists, and when necessary, a psychiatrist. Due to the high levels of burnout  
8 and the several emotional challenges that the pandemic represented, the Department of Psychiatry started to  
9 receive free-of-charge all medical students who wanted counseling through a hybrid method. Students could  
10 decide between virtual or face-to-face. With the beginning of the COVID-19 pandemic, counseling needed to  
11 be adapted to an online format that benefits the students. It is important Universities encourage their alumni to  
12 exercise and obtain quality sleep, as both have been associated with prevention and reduced levels of  
13 burnout.<sup>25</sup> In a university with over 7,000 students total, mental health programs need to be increased and  
14 adapted to social distancing norms.

15  
16 The results of this study demonstrated that the burnout prevalence during the pandemic is 14.9% among first-  
17 year medical students in a Mexican medical school. A high prevalence (53.9%) of emotional exhaustion was  
18 present and a significantly higher risk to present burnout in male students (*Figure 1*). These findings suggest  
19 that advocacy and interventions to improve mental health in medical students are important considering the  
20 impact this syndrome may cause on the quality of life. The academic performance may also be affected by the  
21 course-based changes implemented due to the COVID-19 pandemic.  
22

Accepted Article

1 **REFERENCES.**

- 2
- 3 1. Plutchik R. Burnout: The Cost of Caring—by Christina Maslach, Ph. D. *Psychiatric Services*. 1983;34:650-.
- 4 2. Zis, P., Artemiadis A, Bargiotas P, Nteveros A., Hadjigeorgiou GM, et al. Medical Studies during the
- 5 COVID-19 Pandemic: The Impact of Digital Learning on Medical Students' Burnout and Mental
- 6 Health. *International journal of environmental research and public health*. 2021;18(1): 349.
- 7 3. Salanova M, Bresó E, Schaufeli WB. Hacia un modelo espiral de las creencias de eficacia en el estudio del
- 8 burnout y del engagement. [Towards a spiral model of the efficacy beliefs in the study of burnout and
- 9 engagement.]. *Ansiedad y Estrés*. 2005; 11(2-3): 215-31.
- 10 4. Maslach C, Jackson, S. E., & Leiter, M. P. *Maslach burnout inventory*. Third ed. Wood CPZRJ, editor;
- 11 Scarecrow Education; 1997. 191-218 p.
- 12 5. Olivares-Faúndez VE, Mena-Miranda L, Jélvez-Wilker C, Macía-Sepúlveda F. Validez factorial del Maslach
- 13 Burnout Inventory Human Services (MBIHSS) en profesionales chilenos. [Factorial validity of Maslach
- 14 Burnout Inventory Human Services (MBI-HSS) in Chilean Professionals.]. *Universitas Psychologica*. 2014;
- 15 13(1): 145-59.
- 16 6. Schaufeli WB, Salanova M, González-Romá V, Bakker, A. B. The measurement of engagement and
- 17 burnout: A two sample confirmatory factor analytic approach. *Journal of Happiness studies*. 2002;3:71-92.
- 18 7. Mikolajczyk RT, El Ansari W, Maxwell AE. Food consumption frequency and perceived stress and
- 19 depressive symptoms among students in three European countries. *Nutr J*. 2009;8(1): 1-8.
- 20 8. Williams ES, Konrad TR, Linzer M, McMurray J, Pathman DE, Gerrity M, et al. Physician, practice, and
- 21 patient characteristics related to primary care physician physical and mental health: results from the Physician
- 22 Worklife Study. *Health Serv Res*. 2002;37(1):121-43.
- 23 9. Dugani S, Afari H, Hirschhorn LR, Ratcliffe H, Veillard J, Martin G, et al. Prevalence and factors associated
- 24 with burnout among frontline primary health care providers in low- and middle-income countries: A systematic
- 25 review. *Gates open research*. 2018; 2: 4. eng
- 26 10. Arora A, Kannan S, Gowri S, Choudhary S, Sudarasan S, Khosla PP. Substance abuse amongst the
- 27 medical graduate students in a developing country. *Indian J Med Res*. 2016;143(1):101-3.
- 28 11. Park CL, Armeli, S, Tennen H. The daily stress and coping process and alcohol use among college
- 29 students. *Journal of studies on alcohol*. 2004;65(1):126-135.
- 30 12. Krebs C, Quiroga-Garza A, Pennefather P, Elizondo-Omaña RE. Ethics behind technology-enhanced
- 31 medical education and the effects of the COVID-19 pandemic. *Eur J Anat*. 2021;25(4): 515-522.
- 32 13. Wright, K., Sarangi, A., & Ibrahim, Y. (2020). The psychiatric effects of COVID-19 thus far: a review of the
- 33 current literature. *The Southwest Respiratory and Critical Care Chronicles*, 8(35), 17-28
- 34 14. Sarangi, A., Sozan Fares, & Noha Eskander. (2021). Suicide trends in the elderly during the ongoing
- 35 COVID-19 Pandemic- a public health urgency. *The Southwest Respiratory and Critical Care*
- 36 *Chronicles*, 9(40), 31-36.
- 37 15. Amanullah S, Ramesh Shankar R. The Impact of COVID-19 on Physician Burnout Globally: A Review. *Healthcare (Basel)*. 2020;8(4): 421.
- 38 16. Kannampallil TG, Goss CW, Evanoff BA, Strickland JR, McAlister RP, Duncan J. Exposure to COVID-19
- 39 patients increases physician trainee stress and burnout. *PLoS One*. 2020;15(8):e0237301.
- 40 17. Aebischer O, Weilenmann S, Gachoud D, Mean M, Spiller TR. Physical and psychological health of
- 41

- 1 medical students involved in the coronavirus disease 2019 response in Switzerland. *Swiss Med Wkly.*  
 2 2020;150:w20418.
- 3 18. Komer L. COVID-19 amongst the pandemic of medical student mental health. *International Journal of*  
 4 *Medical Students.* 2020;8(1):56-7.
- 5 19. Jezzini-Martinez S, Quiroga-Garza A, Jacobo-Baca G, Guzman-Lopez S, Salinas-Alvarez Y, Martinez-  
 6 Garza JH, et al. COVID-19 Causing Burnout Among Medical Students. *FASEB J.* 2021. 35(S1):S1.04749.
- 7 20. Muñoz-Leija MA, Zarate-Garza PP, Jacobo-Baca G, Quiroga-Garza A, Salinas-Alvarez Y, Martinez-Garza  
 8 JH, et al. Modifications to the delivery of a gross anatomy course during the COVID-19 pandemic at a  
 9 Mexican medical school. *Eur J Anat.* 2020;24(6):507-512.
- 10 21. Martínez CH, Domínguez CC. Validación del cuestionario Maslach Burnout Inventory-Student Survey  
 11 (MBI-SS) en contexto académico colombiano. [Validation of the Maslach Burnout Inventory-Student Survey  
 12 (MBI-SS) questionnaire in a Colombian academic context.] *CES Psicología* 2016;9(1):1-15.
- 13 22. Hu Q, Schaufeli WB. The factorial validity of the Maslach Burnout Inventory-Student Survey in China.  
 14 *Psychol Rep.* 2009;105(2):394-408.
- 15 23. Asencio-Lopez L, Almaraz-Celis GD, Carrillo Maciel V, Huerta Valenzuela P, Silva Goytia L, Munoz Torres  
 16 M, et al. Burnout syndrome in first to sixth-year medical students at a private university in the north of Mexico:  
 17 descriptive cross-sectional study. *Medwave.* 2016;16(3):e6432.
- 18 24. Son C, Hegde S, Smith A, Wang X, Sasangohar F. Effects of COVID-19 on College Students' Mental  
 19 Health in the United States: Interview Survey Study. *J Med Internet Res.* 2020;22(9):e21279.
- 20 25. Ishak W, Nikraves R, Lederer S, Perry R, Ogunyemi D, Bernstein C. Burnout in medical students: a  
 21 systematic review. *Clin Teach.* 2013;10(4):242-245.
- 22

Accepted, in press

1 **FIGURES AND TABLES.**

2  
3 **Table 1. Categorization by Domain and Severity of Burnout Syndrome.**

Domain	Level	Total (n=154)	Female (n=93)	Male (n=61)	P-value
<b>Emotional exhaustion</b>	Low-moderate	71 (46.1)	48 (51.6)	23 (37.7)	0.090
	High	83 (53.9)	45 (48.4)	38 (62.3)	
<b>Cynicism</b>	Low-moderate	128 (83.1)	84 (90.3)	44 (72.1)	0.003*
	High	26 (16.9)	9 (9.7)	17 (27.9)	
<b>Academic efficacy</b>	Low-moderate	53 (34.4)	26 (28.0)	27 (44.3)	0.037*
	High	101 (65.6)	67 (72.0)	34 (55.7)	
<b>Burnout</b>	Yes	23 (14.9)	7 (7.5)	16 (26.2)	0.001*
	No	131 (85.1)	86 (92.5)	45 (73.8)	

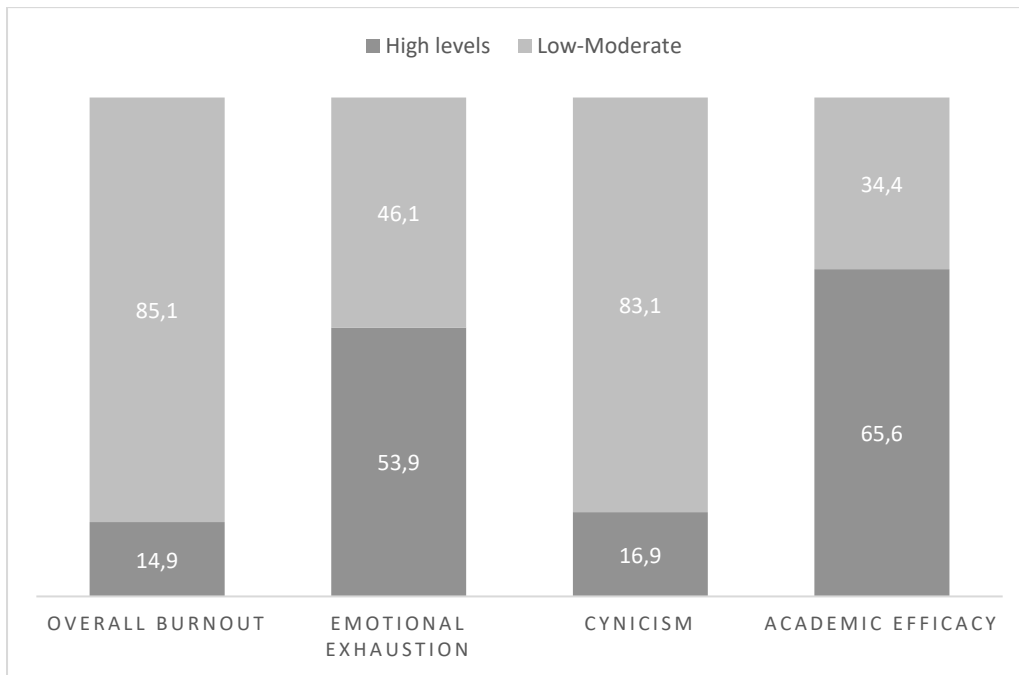
4 All values are expressed are the number of participants and percentages between parenthesis (%). Female  
5 sex is the comparator. \*Statistically significant with a p-value of <0.05. Burnout two-dimensional (Defined as  
6 high emotional exhaustion and cynicism).

7  
8 **Table 2. Association between gender and burnout syndrome**

Burnout	Univariable	Bivariable	p value	Multivariable	p value
<b>Female</b>	7 (7.5)	-	-	-	-
<b>Male</b>	16 (26.2)	4.3 (1.6-11.3)	.001*	4.8 (1.7-13.3)	0.002*

9 All values expressed in number of participants and percentages between parenthesis (%). Female gender is  
10 the comparator. \*Statistically significant with a p-value of <0.05. Burnout two-dimensional (Defined as high  
11 emotional exhaustion and cynicism). Multivariable analysis after age adjustment.  
12

1 **Figure 1. Domains of Burnout Syndrome.**



2  
3 All values are expressed in percentages. Burnout two-dimensional (Defined as high emotional exhaustion and  
4 cynicism).  
5  
6

Accepted, in press