IJMS INTERNATIONAL JOURNAL of MEDICAL STUDENTS

Short Communication

Burnout Among First-Year Medical Students During COVID-19 Pandemic in Mexico: A Cross-Sectional Study

Sofía Jezzini-Martinez,[1] Javier Humberto Martinez-Garza,[2] Alejandro Quiroga-Garza,[2] Pablo Patricio Zarate-Garza,[2] Guillermo Jacobo-Baca,[2] Jorge Gutierrez-De la O,[3] David de la Fuente-Villarreal,[2] Yolanda Salinas-Alvarez,[3] Rodrigo Enrique Elizondo-Omaña,[2] Santos Guzman-Lopez.[2]

Abstract

Background: The coronavirus pandemic is an international public health emergency without precedence in modern history. It represents a challenge to students' academic and psychological stability due to the changes it caused in daily life. This study aimed to evaluate the prevalence and level of burnout in medical students caused by the academic and psychological instability that the pandemic represents. **Methods:** A prospective cross-sectional study was designed using the Maslach Burnout Inventory-Student Survey (MBI-SS). This evaluated the emotional exhaustion due to study demands, cynicism, and negative self-academic efficacy. This study was based in the school of medicine of the Universidad Autonoma de Nuevo Leon (UANL) in Monterrey, Mexico, during the Spring semester of 2020. **Results:** A total of 154 (93 women and 61 men) first-year medical students participated (response rate of 36.4%). Burnout was identified in 14.9% (n=23), and high emotional exhaustion in 53.9% (n=83). Burnout was almost 4 times more likely to develop in men than in women (aOR = 4.8; 95% Confidence Interval=1.7-13.3) when considering age as a covariable in the multivariable model. **Conclusion:** Further epidemiological studies of burnout syndrome in medical students are needed, and schools should consider promoting mental health and making programs available for their students to help overcome the emotional and social challenges during the pandemic.

Key Words: Psychological burnout; COVID-19; Pandemic; Medical students (Source: MeSH-NLM).

Introduction

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

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

The Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) pandemic, also known as COVID-19, has changed people's lives across the globe. From the mandatory self-isolation

1 Fourth-year Medical Student, Department of Human Anatomy, School of Medicine, Universidad Autónoma de Nuevo Léon, Monterrey, Mexico.
2 MD. PhD. Universidad Autónoma de Nuevo Léon, Monterrey, Mexico.
3 MD. Universidad Autónoma de Nuevo Léon, Monterrey, Mexico

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.*

Correspondence:
Santos Guzman-Lopez
Address: Pedro de Alba S/N, Niños Héroes, Ciudad Universitaria, San Nicolás de los Garza, NL, Mexico
Email: dr.santos.anato@gmail.com

Editor: Francisco J. Bonilla-Escobar
Student Editors: Benjamin Liu, Michael Tavolieri & Muhammad Romail Manan
Copyeditor: Joseph Tonge
Proofreader: Leah Komer

Submission: Jul 28, 2021
Revisions: Aug 23; Oct 13, 2021; Feb 2, 2022
Responses: Sep 10; Oct 13, 2021; Feb 2, 2022
Acceptance: Feb 15, 2022
Publication: Feb 16, 2022
Process: Peer-reviewed

time and use of face masks to a forced transition from face-to-face education to online platforms, changing the environment in which educators and students interact.[12] These sudden outbreaks can precipitate new psychiatric symptoms and aggravate pre-existing mental illnesses.[13] During today's pandemic, the general population has reported increased feelings of anxiety, depression, post-traumatic stress disorder, obsessive-compulsive disorder, insomnia, and suicide.[13] Apart from the psychiatric consequences to the general population, it has been proved that social isolation has substantially increased the suicide risk in older people during the pandemic. Understanding the severity of the problem leads to finding common solutions, such as suicide prevention, dissemination of scientific information, promoting self-help, positive coping, reducing isolation through technology, and developing telehealth.[14]

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

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.

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 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.[20]

The eligibility criteria were to be enrolled in the human anatomy course during the pandemic COVID-19 and be at least 18 years old. The students enrolled in the Gross Human Anatomy course were second-semester medical students, and they had presential (face-to-face) courses in the previous 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 human anatomy department's official website during the spring semester's last week (June 22 to June 26, 2020). The survey contained an online informed consent where the students had the opportunity to deny their participation in the study or answer voluntarily. The age and sex of the students were collected, then the Maslach Burnout Inventory-Student Survey (MBI- SS)[21-22] 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). [21-22]

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). The Kolmogorov-Smirnoff test was used to evaluate the normality of the data. Quantitative variables were summarized using central tendency and dispersion measures, 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.

Results

A total of 154 first-year medical students were included on the study, 60.3% (n =93) were female and 39.6% (n=61) were male (response rate 36.4%). The ages ranged between 18 and 24 years, and the mean age was 18.9 ± 0.9 years. Based on the MBI-SS definition, 14.9% (n=23) of the study participants were found to have burnout syndrome, 53.9% (n=83) scored high on emotional exhaustion, 16.9% (n=26) scored high cynicism, and 34.4% (n=53) scored low on academic effectiveness (***Table 1, Figure 1***): Men had a statistical tendency towards lower academic effectiveness (p=0.037) and increased cynicism (p=0.003) than women, as well as a higher incidence of burnout (26.6% vs 7.5%, p=0.001).

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

Table 1. Categorization by Domain and Severity of Burnout Syndrome.

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

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

Table 2. Association Between Gender and Burnout Syndrome.

Burnout	Univariable	Bivariable	p value	Multivariable	p value
Female	7 (7.5)	-	-	-	-
Male	16 (26.2)	4.3 (1.6-11.3)	0.001*	4.8 (1.7-13.3)	0.002*

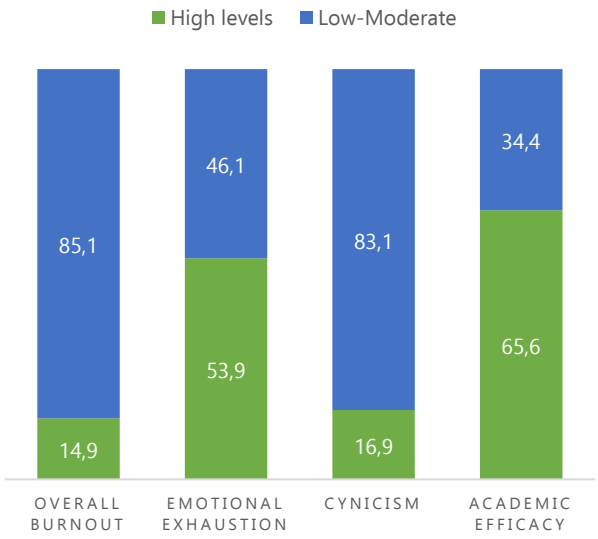
Legend: All values expressed in number of participants and percentages between parenthesis (%). Female gender is the comparator. *Statistically significant with a p-value of <0.05. Burnout two-dimensional (Defined as high emotional exhaustion and cynicism). Multivariable analysis after age adjustment.

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, and experienced 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. Previously studies had addressed burnout syndrome; however, their focus was on student involvement in clinical scenarios rather than prevalence. A study in Switzerland 2020 surveyed medical students and residents involved in COVID-19 scenarios and their non-involved peers to determine anxiety, depression, and burnout levels. Both medical students and residents reported lower levels of anxiety, depression, and burnout, compared with their non-involved peers.[17] In 2016, the prevalence of burnout among medical students was evaluated at a Mexican University before the COVID-19 pandemic.[23] 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 and drug use, should also be considered.

Figure 1. Domains of Burnout Syndrome.



Legend: All values are expressed in percentages. Burnout two-dimensional (Defined as high emotional exhaustion and cynicism).

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[12-13]. In the United States 2020, a study reported that 71% of college students had increased stress, anxiety, and depressive

thoughts due to COVID-19 associated with difficulty concerning, sleeping disruption, decreased social interactions and increased concerns about academic performance.[24] 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.[25]

The results of this study demonstrate that at least 14.9% of our medical students are at risk of developing the negative effects of 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 group (prior to the pandemic); therefore, the high prevalence of burnout can only be hypothesized as due to the pandemic but cannot be objectively shown. The survey was only answered by 154 students enrolled in the human anatomy course of more than 500. The mean age (18.9 years) is younger than in other medical schools, and maturity may also influence the prevalence.

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

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

References

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

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

Acknowledgments

None.

Conflict of Interest Statement & Funding

The Authors have no funding, financial relationships or conflicts of interest to disclose.

Author Contributions

Conceptualization, Methodology, Writing – Original Draft Preparation, & Writing – Review & Editing: SJM, AQG. Data Curation: SJM, JHMG, AQG. Formal Analysis, & Software: SJM. Funding Acquisition & Visualization: SJM, JHMG, AQG, PPZG, GJB, JGDO, DFV, REEO, SGL. Investigation: SJM, AQG, JGDO. Project Administration: AQG, DFV, REEO, SGL. Resources: JHMG, AQG, PPZG, KGDO, DFV, YSA, SGL. Supervision: JHMG, AQG, PPZG, GJB, JGDO, DFV, YSA, REEO, SGL. Validation: JHMG, PPZG, GJB, JGDO, DFV, YSA, REEO, SGL.

Cite as

Jezzini-Martinez S, Martinez-Garza JH, Quiroga-Garza A, Zarate-Garza PP, Jacobo-Baca G, Gutierrez-De la O J, et al. Burnout Among First-Year Medical Students During COVID-19 Pandemic in Mexico: A Cross-Sectional Study. Int J Med Stud. 2022 Apr-Jun;10(2):180-4.

ISSN 2076-6327

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