

Emotional exhaustion, burnout, and perceived stress in dental students

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Abstract

Objective: As in other health sciences, a career in dentistry is associated with numerous stressors in practitioners. The main objective of this research was to examine the prevalence of emotional exhaustion, burnout, and perceived stress among dental students in Mexico.

Methods: A cross-sectional study was conducted among 73 dental students attending a private university in Northern Mexico. Three scales were administered to students to identify emotional exhaustion, burnout, and perceived stress, and parametric data analysis was performed.

Results: Among participants (mean age 19.7 years), the proportion with emotional exhaustion, perceived high stress, and burnout was 52.0%, 42.3%, and 17.8%, respectively. All students with perceived stress also had burnout.

Conclusions: We found that emotional exhaustion and perceived stress are experienced by a large proportion of dentistry students enrolled in the third semester at this private university in Northern Mexico. The proportions were independent of age and sex.

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Introduction

Burnout has been defined as a prolonged response to chronic emotional and interpersonal stressors. The global literature has identified three dimensions of burnout, namely, exhaustion, cynicism, and professional inefficacy.¹ Emotional exhaustion, burnout, and stress are terms commonly used in the literature pertaining to work-related problems,² and a number of studies have examined the prevalence and effects of burnout among health professionals and students in health-related fields such as nursing, medicine, and dentistry.³⁻⁵ Burnout impairs both personal and social functioning and often results in reduced work quality and damage to psychological health.⁶ The psychological impacts of burnout among students include depression, poor quality of life, lack of academic achievement, abandonment of education and career aspirations, and suicidal ideation.⁷⁻⁹ The World Health Organization advocates additional research focusing on suicide prevention.¹⁰

Stressors associated with dentistry are distinct from those experienced in the nursing and medical fields and also vary according to the career stage.¹¹⁻¹³ Studies have demonstrated that dental students exhibit exhaustion and depersonalization more frequently than medical students;¹⁴ affected students experience high rates of alcohol and illicit drug use, which increase with intensification of academic responsibilities.¹⁵ High stress rates have been found among students in the first year of both medical and dental school,¹⁶ but unlike

medical students whose stress level may decline with advanced academic stages, stress among dental students continues throughout their academic and professional careers.^{4,17}

Dental students face a highly demanding learning environment as the profession requires both theoretical and clinical knowledge, as well as face-to-face practice and daily patient interaction.¹⁸ High rates of premature retirement among dental practitioners have been attributed to chronic diseases related to somatic pathologies derived from stress experienced in their professional practice.¹⁹ Few studies have focused on interventions to reduce stress, with separate assessment of the dimensions of emotional exhaustion.²⁰ Burnout syndrome occurs owing to stress and has been identified in academic contexts as a predictor of student performance, expectations of success, and a predisposition to drop out of school.²¹

As elsewhere, research conducted in Mexico has indicated high levels of emotional exhaustion and medium levels of depersonalization among dental students enrolled at public universities.²² Thus, it is important to assess students' stress levels as high-stress conditions can lower levels of academic commitment and satisfaction as well as impair students' performance.²³

The main objective of this study was to assess emotional exhaustion, burnout, and perceived stress among dental students at a private university in Northern Mexico. Because stress increases the risk of suicide and dropping out of school, these data can

be useful to administrators and school counselors in developing appropriate interventions.^{7,24,25}

Methods

Study setting and design

We conducted a descriptive cross-sectional study at a private university located in a suburban area 60 kilometers south of Monterrey, the third most important city in Mexico owing to its population density and economy.

Population

Recruitment for the study was restricted to dental students enrolled in the third semester who had completed at least 1 year of dental education but had not yet begun seeing patients. As enrollment is small at this university, practically all students in that cohort were included.

The study population encompassed students of any age and sex who were enrolled and attended classes regularly during the period from August to December 2017. Students participated voluntarily and were required to sign a letter of informed consent and to respond to at least 95% of items on the scales used in this study.

We excluded students from another university or another campus and those who provided incomplete surveys or illegible responses.

Instruments

As emotional exhaustion is a major component of burnout,¹ we assessed this using the Emotional Exhaustion Scale (EES), which has been previously validated in studies involving university students in Mexico.^{26,27} The EES was designed by Ramos et al.²⁷ in 2005 and comprises 10 items, presenting an acceptable degree of internal consistency with a Cronbach's

alpha of 0.83. Response on the EES are given on a five-point Likert scale (1 = rarely to 5 = always). Thus, the minimum score is 10 and the maximum score is 50; an EES score greater than 26 is considered positive, according to the previously validated cut-off point.^{26,27}

The Perceived Stress Scale (PSS) was used to assess career-related stress levels, as perceived by the students.²⁸ Designed by Cohen et al.,²⁸ the PSS was adapted for students in Mexico by González and Landero.²⁹ The scale comprises 14 items with response options on a four-point Likert scale (1 = never to 4 = very often). The PSS presents an internal consistency of 0.83 (Cronbach's alpha). Scale scores range from 14 to 56, and a score greater than 22 is considered positive, according to the previously validated cut-off value.^{28,29}

Although Maslach and Jackson's Maslach Burnout Inventory (MBI; 1981) is the most widely used instrument to assess burnout,³⁰ we chose to use the Maslach Burnout Inventory–Student Survey (MBI-SS),³¹ which was developed by Schaufeli et al.³¹ from the Maslach Burnout Inventory–General Survey (MBI-GS). This inventory has 15 items subdivided into three groups: 1) emotional exhaustion (5 items), 2) depersonalization (4 items), and 3) professional efficacy (6 items). All items are evaluated using frequency and are measured using a seven-point Likert scale (0 = never, 1 = once a year or less, 2 = once a month or less, 3 = a few times per month, 4 = once a week, 5 = a few times per week; and 6 = every day).³¹ This scale was previously validated for use among Latin American students by Hederich et al.,³² with an internal consistency of 0.76 (Cronbach's alpha). The cut-off values for this instrument were established according to a clinical correlation study performed by Wickramasinghe et al.³³ in 2018; the approximate cut-off

values are >12.5 for emotional exhaustion, >7.5 for cynicism, and <10.5 for professional efficiency.

Procedures

This was a census study with non-probabilistic sampling. Once permission was obtained from the institution's ethics and research committees, the researchers, professors, and students agreed to collaborate. The above three scales were administered simultaneously in a classroom where students regularly attended lectures. The time spent completing the questionnaires was about 1 hour per group. Each participant group completed the questionnaire in turn, until the surveys had been administered to the entire study population.

Data management and statistical analysis

Sociodemographic data were collected using a data collection sheet designed for this study, and scores obtained for each of the scales were summed. All data were entered into a Microsoft Excel database, and statistical analysis was performed using IBM SPSS version 25 (IBM Corp., Armonk, NY, USA). We used parametric statistical analysis, as the data displayed a normal distribution according to the Kolmogorov test. Proportions were calculated for qualitative variables and averages, and measures of central tendency and dispersion were calculated for quantitative data. The proportions of students with burnout, emotional exhaustion, and perceived stress were calculated according to the results of the surveys. Finally, a cross-tabulation analysis was performed using Fisher's chi-squared test, by dichotomizing the dependent variables, to analyze socio-demographic variables associated with the presence of burnout, emotional exhaustion, and perceived stress.

We did not subject the instruments to additional factorial analysis because they have all been validated and some have been clinically tested.³³ In addition, we used the cut-off points established in previously validated scales that were either created or adapted for use among Latin American populations.

Ethical considerations

This protocol was evaluated, approved, and registered by the ethics and research committees of the institution.

The present study adhered to all the recommendations for carrying out research on human beings issued in the Declaration of Helsinki of 1964, with subsequent amendments. All respondents participated voluntarily and signed an informed consent form.

Results

We evaluated outcomes of the 73 surveyed students; Table 1 presents the sociodemographic characteristics of participants. Nearly 65% of participants were women, with a sex ratio of 1.8:1, and the vast majority were below 23 years of age. A few students reported having a scholarship. More than 34% of students were pursuing dentistry as a second career, and nearly 30% were working at the time of their participation in the study.

Table 2 shows the central and dispersion values of emotional exhaustion calculated using the EES scale, perceived stress assessed with the PSS, and global outcomes on the MBI-SS, as well as the quantitative outcomes in all dimensions of the MBI-SS. With regard to results of the MBI-SS, the median and mean for emotional exhaustion were higher than previously reported; however, values for cynicism and professional efficiency showed medians below the selected cut points.

Table 3 presents the mean differences among burnout, emotional exhaustion, and perceived stress according to dichotomized sociodemographic variables. As the table illustrates, a comparison among these variables showed no significant differences in the means between male and female participants.

Table 1. Sociodemographic characteristics of participants (n = 73).

Characteristic	Frequency (n)	Proportion (%)
Sex		
Female	47	64.38
Male	26	35.62
Age, years		
18–22	68	93.15
>23	5	6.85
Scholarship		
Yes	2	2.73
No	71	97.67
Working		
Yes	21	28.76
No	52	71.23
Educational credit		
Yes	8	10.95
No	65	89.05
Previous career		
Yes	25	34.24
No	48	65.75

Table 4 shows the qualitative outcomes concerning burnout according to the MBI-SS scale and differences in frequency according to the factors of sex, work, or second career. Cross tabulation revealed no statistically significant differences correlating with those sociodemographic variables.

Table 3. Mean difference and t-test results for comparisons of quantitative EES, PSS, and MBI-SS scores.

Sex	EES	PSS	MBI-SS
Female			
Mean	25.91	22.49	35.91
N	47	47	47
SD	7.10	5.84	17.05
Median	25.00	23.00	35.00
Male			
Mean	26.62	23.04	42.92
n	26	26	26
SD	7.34	5.19	17.84
Median	31.00	23.00	38.00
Sum			
Mean	26.16	22.68	38.41
n	73	73	73
SD	7.14	5.59	17.54
Median	25.00	23.00	37.00
t-test (p value)	0.41	0.63	0.14

Abbreviations: SD, standard deviation; EES, Emotional Exhaustion Scale; PSS, Perceived Stress Scale; Maslach Burnout Inventory–Student Survey (MBI-SS).

Table 2. Central tendency and dispersion of survey values measuring dental students' levels of emotional exhaustion, perceived stress, and burnout (n = 73).

	Minimum	Maximum	Mean	SD	Variance	Median
Age, years	18	25	19.73	2.02	4.03	19.00
EES Scale	14	35	26.16	7.14	51.08	25.00
PSS Scale	12	33	22.68	5.59	31.30	23.00
MBI-SS Inventory	2	79	38.41	17.54	307.46	37.00
EE +	0	30	14.26	9.17	84.16	13.00
CY ++	0	21	8.30	5.77	33.38	7.00
PE +++	2	35	15.90	7.31	53.44	13.00

+ Emotional Exhaustion Score (MBI-SS), ++ Cynicism (MBI-SS), +++ Professional efficiency (MBI-SS).

Abbreviations: SD, standard deviation; EES, Emotional Exhaustion Scale; PSS, Perceived Stress Scale; Maslach Burnout Inventory–Student Survey (MBI-SS).

Table 4. Results of cross-tabulation analysis between burnout and representative qualitative sociodemographic variables (n = 73).

Variable	BURNOUT			p value
	No	Yes	Sum	
Sex				
Female	40	7	47	0.28
Male	20	6	26	
Working				
No	41	11	52	0.20
Yes	19	2	21	
Second career				
No	38	10	48	0.27
Yes	22	3	25	

The results of the present study showed normal average values of emotional exhaustion and perceived stress; the proportion of respondents with a high level of emotional exhaustion was 52.0% and that of participants with perceived high stress was 42.3%. In contrast, the proportion of students with burnout, as assessed with the MBI-SS, was relatively low at 17.8%.

The prevalence of emotional exhaustion according to the EES versus outcomes of the MBI-SS was very similar, at 50.7% versus 52.0%, respectively. The results of statistical analysis examining possible associations among emotional exhaustion, perceived stress, and student burnout demonstrated no significant differences among these proportions.

Discussion

Stress and emotional exhaustion influence both the academic activities of dental students and the quality of patient treatment. In addition, stress and emotional exhaustion can trigger other psychological disorders such as depression, which can result in school dropout and increased risk of suicide.²³⁻²⁵ Other studies investigating the experiences of university students regarding

such issues have largely focused on validating existing instruments designed to evaluate emotional exhaustion, perceived stress, and burnout.^{26,32}

Specifically, the EES scale developed by Ramos and used to measure emotional exhaustion was validated by Gonzalez and Dominguez,^{26,27,34} with some studies conducted among university students in Mexico. Thus, this instrument has been subjected to factorial analysis and its construct validity has been demonstrated.

In this study, our main objective was to determine the prevalence of exhaustion, perceived stress, and emotional exhaustion in a population of third-semester dentistry students rather than scale validation using factorial analysis. We performed parametric statistical analysis as the data were normally distributed. Most students lived near the university in suburban neighborhoods. We decided to exclusively enroll students who were in the third semester of their academic career and who were not yet seeing patients. The purpose of including only third-semester students was to have a baseline for comparison with students at the same and at more advanced academic stages, who are enrolled in other public or private institutions. This will be of great advantage in planning subsequent steps to address this problem in university students.

The special characteristics of our study participants distinguish them from other dental students because the study university is located in a suburban area, with most students living on or very close to the campus. These dentistry students did not have contact with patients during their first semesters at university. Nevertheless, this population may experience stress owing to various causes, such as a lack of free time, close supervision of their academic activities, or pressure to obtain good examination results. The main limitations of our work were the sample size and that the study population only included

third-semester students. These limitations cannot be corrected because we analyzed the total population. In fact, these limitations might be advantageous because it can be argued that even among students at small dentistry schools located in suburban areas, stress and emotional exhaustion have the same effect as on students at large universities in urban areas.

Our findings align with those of other studies that have revealed a high prevalence of stress among university students. However, in contrast to the higher rates of stress among women in other reports,^{35,36} our findings revealed no sex-related differences in stress levels. This result may be owing to certain characteristics of the sample size or the existence of constant and general stressors independent of sex, potentially derived from instructor evaluations, work and task overload, and time constraints.³⁷

The prevalence of stress was high among participants even though most did not have scholarships, which require students to maintain high grade averages. As most respondents were young and single, marital status was not included as a variable. Consequently, even though most participants were women, none had children; it is possible that the responsibilities of parenting might result in increased stress levels.

Stress levels among dental students could explain the proportion (100%) of participants who expressed some degree of emotional fatigue, regardless of level. Once students are involved in situations that generate stress, if these issues are not adequately addressed, emotional exhaustion can result. Emotional fatigue is among the most important responses to stressful environmental stimuli as it can lead to emotional and cognitive distancing, thus negatively impacting students' learning.^{17,21}

Our results coincide with other research findings that have highlighted higher levels of emotional exhaustion among health

science students, although the prevalence of this condition among our participants was higher than those reported in other studies.^{17,38}

The relatively low rate of burnout among our participants, according to the MBI scale for university students, is consistent with models proposing that emotional fatigue closely precedes the onset of burnout. In other words, perceived stress may be an early indicator of burnout syndrome that emerges ahead of manifestations of depersonalization and lack of academic achievement.³⁵

However, synchronicity of the presentation and consequences of emotional fatigue is also feasible, as is the reciprocal transition of its interactions with poor academic performance. It is possible that emotional fatigue can affect academic success or conversely, poor performance levels may facilitate the escalation of emotional fatigue.³⁹ Either or both of these interpretations could explain the low prevalence of burnout found in our study.

Conclusions

Based on the results of this study, we can conclude that a large proportion of dentistry students enrolled in the third semester at the present private university in Northern Mexico experience high degrees of emotional exhaustion and perceived stress. Our findings showed that the prevalence of these issues was independent of participants' age and sex and were most likely independent of their work or school situations as well. Although the prevalence of burnout was relatively low in our study population, follow-up analysis may be necessary in this group, to determine the evolution of symptoms over time. It is also essential to examine larger populations, to more clearly identify those factors associated with emotional exhaustion and perceived stress.

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Declaration of conflicting interest


The authors declare that there is no conflict of interest.

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