

INVESTIGATING THE RELATIONSHIP BETWEEN ACADEMIC BURNOUT AND DENTAL ENVIRONMENT STRESS AMONG DENTAL STUDENTS

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ABSTRACT

Considering the problems caused by job stress and the burnout caused by this stress, the purpose of this research was to investigate the relationship between dental environment stress and academic burnout in dental students. The current study was analytical-cross-sectional and sampling was done by available methods. In this study, the Dental Environment Stress (DES) and Burnout Clinical Subtype Questionnaire (BCSQ-12-SS) were used to collect information from dental students. Data were analyzed using SPSS23 software and Kruskal-Wallis, Mann-Whitney U, linear regression tests, and Spearman's correlation coefficient. In this study, the average age of the participants was 24.25. The average score of academic burnout was reported as 2.61 out of the maximum score of 5. The most influencing dimension of burnout was related to the overload dimension. The average score of DES was reported as 2.80 out of the maximum score of 4, and the most influential dimension of DES was the dimension of clinical education. A direct correlation was reported between dental environment stress and academic burnout ($P < 0.001$). According to the results of this study, it can be said that academic burnout among dental students is average, and stress in the dental environment is high. Considering the direct relationship between stress and burnout, more efforts should be made to reduce stress in the dental environment, especially in the field of clinical education.

Key words: Stress, Dental, Environment, Burnout, Students.

Introduction

Education and learning are an important part of every human's life, and all human beings undergo education and training throughout their lives. Considering that the environment has a very important effect on learning, accuracy in its design should be considered [1, 2]. Classrooms not being challenging and not providing a suitable learning opportunity, not paying attention to students' points of view, not paying attention to establishing good relationships with students, and not paying attention to their problems during their studies can cause dissatisfaction among students and ultimately lead to exhaustion [3, 4]. Job burnout is a psychological process that occurs under conditions of severe job stress and can be considered as a syndrome with three dimensions including overload, lack of progress, and neglect. In the studies conducted on students, burnout is considered academic burnout, which is described as the feeling of inadequacy and mental fatigue due to the inability to perform all assigned tasks [5].

Academic burnout has reduced efficiency in education and learning, which can interfere with achieving the educational goals of universities [6, 7]. Academic burnout hurts the student's cognitive commitment, his interest in course topics, and his participation in class activities and affects his ability to learn [8].

Academic burnout is the result of being exposed to stressful

factors in the academic environment. Burnout does not appear quickly, but in the long term, and if students continue to study in the same situation, this burnout will remain stable and permanent [9]. Research related to burnout in dental students has increased in recent years and has focused more on the clinical period [10].

Dentistry is a challenging profession due to exposure to physical and emotional stressors such as complex treatments, long treatment times, and the use of sharp and harmful tools for the patient and the dentist, as well as dealing with anxious patients. Long-term exposure to these stressful factors and the accumulation of negative effects caused by stress can lead to burnout [11]. In recent years, researchers in the field of health care, especially on burnout, have paid attention to the development and improvement of the higher education system. Dental training among other high-risk groups is especially important because of the long and hard training period [12]. Existing studies have reported moderate to high levels of burnout among dental students [5, 11, 13].

A long-term mismatch between situational demands and individual capacities to deal with stress can lead to job burnout [14]. Therefore, one of the influencing variables on academic burnout is perceived stress [15]. Stress is a natural psychological response to events that cause fear or anxiety. In medicine, stress is defined as an emotional trait that can be the beginning of many psychosomatic disorders [16].

Various studies have shown relatively high perceived stress in dental students. The amount of stress perceived by dental students in Saudi Arabia is equal to 54.7% [17], in India it is equal to 43% [18], in France it is equal to 99.4% [19], and in Canada, it is equal to 83% [20]. In addition, the amount of stress has been observed in girls more than boys [13]. In most studies, the greatest stress in the dental environment was caused by exams and the fear of not getting a passing grade in the exam or failing the course [14, 21]. There are few studies on the simultaneous study of academic burnout and stress in dental students. In Jiménez-Ortiz *et al.* study [22], all students with stress also had burnout. Shetty *et al.* [13] also reported moderate to high levels of stress and burnout in specialized dental students.

Considering the problems caused by occupational stress and the burnout caused by this stress [15, 23] and also considering the relatively high prevalence of stress among dental students, the purpose of this research is to determine the level of academic burnout of dental students and its relationship with the stress of the dental environment.

Materials and Methods

To carry out the present analytical-cross-sectional study, students were invited to enter the study using the available sampling method. The sample size required to determine the simple correlation coefficient between academic burnout and stress at the error level of $\alpha = 0.05$, the power of the test is 80% ($\beta = 0.2$) and the minimum value of the correlation coefficient for the significance of the relationship is 20%. Additional sample due to the possible confusion of the questionnaires, at least 230 people were determined to be in the sample.

Data collection was done using a questionnaire. Questionnaires were completed online by students through social networks. To increase trust and attract participation in the text of the sent invitation, the students were informed about the identity of the researcher as well as the goals and necessity of the research. All students eligible to enter the study had access to the questionnaire through virtual networks and the possibility to enter the study, and the volunteers answered the questionnaires until the desired sample size was reached. The questionnaires were completed over three months.

Burnout Clinical Subtype Questionnaire (BCSQ-12-55) was used to investigate academic burnout. The said questionnaire is designed for dental students [24]. This questionnaire includes three areas: 1- overload (4 questions), 2- lack of development (4 questions), and 3- neglect (4 questions). Using a five-point Likert scale, students express their agreement with each statement from "strongly disagree" (score 1) to "strongly agree" (score 5). Therefore, the academic burnout score for each individual is between 12 and 60. In addition, the scaled average score of academic burnout was calculated by dividing the total scores

of each dimension by the number of questions, which is a number between 1 and 5. According to the maximum possible score of 5, up to a score of 2.4, the burnout level is low, between 2.4 and 3.8 is medium, and above 3.8 is high.

The Dental Environment Stress Questionnaire, which is a standard tool to determine the sources of stress and the stress level of students in the dental school, was used to investigate the stress of the dental environment [14]. This questionnaire includes 32 questions in 6 areas: academic performance (7 questions), treatment of patients (4 questions), internal beliefs (4 questions), academic factors (2 questions), clinical education (11 questions), and other matters (4 questions). This questionnaire is used to identify and classify student stressors in the dental school environment. Students' stress levels are evaluated using a four-point Likert scale from no stress (score 1) to extreme stress (score 4). Therefore, the dental environment stress score for each individual is between 32 and 128.

Due to the difference in the number of questions of different dimensions in the dental environment stress questionnaire, to enable the comparison between dimensions, a scaled average was used, which means that the sum of the scores of each dimension was divided by the number of questions. The scaled average of dental environment stress scores is between 1 and 4. According to the maximum possible score of 4, the stress level up to 2 is low, between 2 and 3 is medium, and above 3 is high. In addition, questions were asked about the demographic characteristics of the participants, including gender, age, marital status, residential status, and economic status, and also questions about their educational characteristics, including the type of university, place of study, academic year, and last year's GPA. After collecting the data, the data was entered into SPSS software version 23.

According to the result of the Kolmogorov Smirnov test, due to the non-normality of the distribution of the variables of academic burnout and stress in the dental environment, from the Mann-Whitney U test to examine the status of the variables of academic burnout and stress in the dental environment among the two-mode variable classes of gender, marital status and type of university, the test Kruskal-Wallis to investigate the status of the variables of academic burnout and stress in the dental environment among the classes of multi-mode variables of residence status and economic status, Spearman's correlation coefficient to investigate the relationship between the variables of academic burnout and stress in the dental environment with the variables of age, academic year and last year's GPA and also Linear regression (Enter method) was used to examine the factors affecting each of the variables of academic burnout and stress in the dental environment at the error level of 0.05.

Results and Discussion

A total of 300 dental students were included in the present study (response rate: 64%). The demographic and academic characteristics of the participants showed that the average age of the students was 24.25 ± 2.72 years with a range of 20-38 years. More than half of the participants (54.7%) were women. Most of the people in the sample were single (88.9%) and lived with their families (70.6%). Also, the majority of people had an average economic status (67%).

According to the results, the average score of dental students was 31.24 ± 7.91 with a range of 12-60. The highest average was related to the overload (13.35 ± 3.51). The scaled average score of academic burnout was equal to 2.61 ± 0.66 compared to the maximum obtainable score of 5 at the average level. According to the non-normal distribution of the educational burnout variable, the median and interquartile range are also reported in **Table 1**.

Table 1. Academic burnout and its dimensions from the point of view of dental students (n = 300)

Variable	Dimensions	Mean ± SD	Min.	Max.	Range	Interquartile range
Academic burnout	Overload	13.35 ± 3.51	4	20	14	6
	Lack of development	8.96 ± 4.30	3	20	8	6
	Neglect	8.96 ± 3.65	4	20	8	3
	Total	31.24 ± 7.91	12	60	31	10

According to the non-parametric Mann-Whitney U test, there was no significant difference in students' academic burnout between the classes of students' gender variables and their marital status ($P > 0.05$). Also, based on the non-parametric Kruskal-Wallis test, there was no significant difference in students' academic burnout between the classes of students' residence status and their economic status ($P > 0.05$). According to the Spearman correlation test, the

academic burnout variable had no significant correlation with the age of the students ($P = 0.30$, $r = 0.06$) and their GPA last year ($P = 0.42$, $r = -0.05$), but there was a direct and significant correlation. A weak level of correlation was observed between academic burnout and academic year ($P = 0.01$, $r = 0.14$). Based on the multivariate linear regression model, none of the independent variables had a significant effect on the academic burnout variable ($P > 0.05$).

Table 2. Dental environment stress and its dimensions from the point of view of dental students (n = 300)

Variable	Dimensions	Mean ± SD	Min.	Max.	Range	Interquartile range
Dental environment stress	Academic performance (7 questions)	19.97 ± 4.05	7	28	21	5
	Treatment of patients (4 questions)	11.05 ± 2.56	1	16	11	4
	Inner beliefs (4 questions)	11.36 ± 3.26	4	16	12	5
	Academic factors (2 questions)	5.14 ± 1.59	2	8	5	2
	Clinical training (11 questions)	31.56 ± 7.06	8	44	33	8
	Other cases (4 questions)	10.39 ± 2.62	4	16	11	4
	Total	89.43 ± 16.29	32	126	93	20

According to the results of **Table 2**, the average stress score of the dental environment from the student's point of view was 89.43 ± 16.29 with a range of 32 to 126. Due to the difference in the number of questions in each dimension, the scaled average was used to compare the scores of different dimensions. Based on the scaled average, the highest average is related to clinical education (2.88 ± 0.63), academic efficiency (2.86 ± 0.57), internal beliefs (2.84 ± 0.81), and treatment of patients (2.77 ± 0.62), other cases (2.60 ± 0.65), and academic factors (2.57 ± 0.79). The total stress score of the dental environment was obtained based on the scaled mean equal to 2.80 ± 0.51 .

According to the non-parametric Mann-Whitney U test, there was a significant difference between the two sexes ($P = 0.003$), the stress of the dental environment did not have

a significant difference between the variables of the type of university where the students studied and their marital status ($P > 0.05$).

Also, based on the Kruskal-Wallis non-parametric test, there was no significant difference in the stress of the dental environment between the variables of the students' residence status and their economic status ($P > 0.05$). According to Spearman's correlation test, the dental environment stress variable did not have a significant correlation with the students' age ($P = 0.80$, $r = -0.02$), their GPA last year ($P = 0.388$, $r = 0.05$), and academic year ($P = 0.69$, $r = -0.02$). A multivariable linear regression model was used to investigate the simultaneous effect of students' demographic and academic characteristics on their views on the stress of the dental environment.

Based on this model, the variables of gender and economic status had a significant effect on the stress variable of the dental environment. The stress of the dental environment was reported higher from the point of view of female students than boys, and from the point of view of students with poor economic status, it was higher than those with good economic status ($P < 0.001$). There is a direct and significant relationship between the stress of the dental environment and academic burnout ($P < 0.001$, $r = 0.33$).

The dental profession is challenging due to long-term exposure to physical and emotional stressors, and the accumulation of negative effects caused by this stress can lead to burnout [11]. Therefore, the present study was conducted to investigate academic burnout and its relationship with dental environment stress among dental students.

In the present study, the average total academic burnout of dental students was moderate. According to the report of Shetty *et al.* [13], among the reasons stated for the occurrence of moderate to high academic burnout in specialized dental students are exams and evaluations, lack of time for leisure activities, and insecurity about the future. Kwak *et al.* [11] reported high academic burnout among final-year dental students at Seoul National University in Korea. Considering that the duration of contact with stressful factors and the accumulation of negative effects caused by stress are more in dentists than in dental students [11], it can be expected that the level of burnout in dentists is higher than in students.

Based on the results of multivariate analysis, the level of academic burnout of dental students was not related to any of the studied demographic variables. Similarly, Ghali and Awooda [25] in a study of academic burnout of fourth and fifth year students in ten Sudanese universities reported that burnout components affected male and female students similarly in fourth and fifth years. The level of stress in the dental environment among students was moderate. Similarly, Gambetta-Tessini *et al.* [21] reported moderate dental environment stress in Australian, New Zealand, and Chilean dental students. However, the stress level of dental students in Saudi Arabia was reported to be high in the study of Al-Sowygh [26]. Naturally, dental students have a high level of stress due to the nature of the dental field and the provision of clinical care and treatment. Stress is one of the common problems among dentists and students in this field, and the environment of dentistry and studying in this field causes stress [27].

In the present study, female students had a higher stress level than male students. Only Kumar *et al.* [28] in their study on Indian dental students reported higher perceived stress in boys. The higher stress level in girls can be related to their feeling of pressure and more concern to achieve success [29]. In addition, in the current study, students with poor economic status reported a higher level of dental

environment stress than students with good economic status; while there was no correlation between the economic status and the stress of the dental environment in the study of Shahravan *et al.* [30]. In reviewing the available scientific evidence on the psychological consequences of poverty, Haushofer and Fehr [31] also mentioned poverty as a factor for stress.

The highest level of stress in the students of the present study was observed in the aspect of clinical education. However, in most of the existing studies, including the study of Polychronopoulou and Divaris [14] on Greek dental students and the study of Kumar *et al.* [28], among the factors that cause stress, academic efficiency was the most common cause of stress. Passing exams and getting a passing grade were declared as the main stressors.

In the present study, a positive and significant correlation was observed between academic burnout and stress in the dental environment. Limited studies have investigated these two variables simultaneously in dental students. Although Jiménez-Ortiz *et al.* [22] did not find a significant correlation between burnout and stress among dental students in Mexico, they reported that all students with stress also had burnout. Although Shetty *et al.* [13] did not investigate the relationship between the two variables at the same time, they observed a moderate to high level of stress and burnout in dental students in India.

Conclusion

Considering the problems caused by job stress and the burnout caused by this stress, the purpose of this study was to determine the relationship between dental environment stress and academic burnout in dental students. According to the results of this study, it can be said that academic burnout among dental students is average, and stress in the dental environment is high. Considering the direct relationship between stress and burnout, more efforts should be made to reduce stress in the dental environment, especially in the field of clinical education.

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