



A Comparative Analysis of the Sources and Levels of Stress Among Dental Students at State and Foundation Universities

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Abstract

Background: The aim of this study was to examine the stress levels and the primary sources of stress among fourth- and fifth-year dental students receiving clinical education at state and foundation universities in Türkiye.

Methods: A total of 198 fourth and fifth-year dental students from Çanakkale Onsekiz Mart University and Beykent University, enrolled in the 2024–2025 academic year, participated in this study. The Modified Dental Stress Questionnaire (DES), consisting of 30 questions, was administered to the participants to identify the sources of stress. The responses were evaluated using a 4-point Likert scale, ranging from not stressful (1 point) to very stressful (4 points). The obtained data were statistically analyzed ($P < .05$).

Results: The participants were 71.2% female and 28.8% male; 59.1% were studying at state universities, and 40.9% at foundation universities. The internal consistency of the scale was found to be highly reliable with a Cronbach's alpha coefficient of 0.928. The total DES score of state university students was found to be significantly higher compared to foundation university students ($P = .004$). A significant difference was found between state and foundation universities for 13 different items on the stress scale ($P < .05$).

Conclusion: It was observed that dental students experience high levels of stress, with stress levels being higher among students at state universities. These findings highlight the need for identifying effective strategies to reduce stress and developing different approaches based on the type of university.

Keywords: Dental education, dental students, stress

What is already known on this topic?

- Dental students frequently experience high levels of stress, especially during clinical training.
- Various academic, clinical, and environmental factors contribute to stress in dental education.

What this study adds on this topic?

- Stress levels among dental students were found to be significantly higher in state universities compared to foundation universities.
- The study identified specific stressors that differ between university types, highlighting the need for tailored support strategies.

INTRODUCTION

Dentistry is considered a profession that involves extensive knowledge, advanced skills, and responsibility, and is associated with high levels of stress due to its direct relationship with human health.¹ This stress not only affects dental professionals during practice but also has a significant impact on students during their dental education.² Dental education is a challenging process that requires significant effort and responsibility from students, both academically and practically.³ In this process, the multifaceted expectations, such as acquiring theoretical knowledge, the necessity to develop clinical skills,

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and practical applications based on patient interactions, cause students to experience high levels of stress.⁴ Research has shown that dental students experience higher levels of psychological distress compared to the general population.^{5,6} It has been reported that stress becomes more pronounced, particularly among students transitioning to clinical education, as their professional responsibilities increase.⁷

Clinical dental education, covering the fourth and fifth years, requires not only mastery of theoretical knowledge but also the completion of a series of complex tasks, such as patient acquisition, managing the treatment processes of these patients, and successfully passing the exams required for graduation.⁸ This situation leads to academic and emotional pressure on students.⁹ The stress levels in dental students have attracted the attention of many researchers in the literature, and it has been emphasized that this stress is a significant factor affecting their educational processes, professional success, and overall health.¹⁰⁻¹²

The Dental Environment Stress (DES), developed to assess the stress experienced by dental students, is considered a reliable and widely used measurement tool.^{13,14} The DES was developed to systematically identify the stress factors encountered by students and provides the opportunity to analyze stress sources in detail.^{15,16} The DES has been translated into different languages over time and adapted to various cultural contexts, with its validity and reliability tested.^{1,4,6,8-13} Thus, it has become a commonly preferred standard measurement tool in both national and international comparative studies. Its adaptation to Turkish was carried out in 2019, and its validity and reliability were confirmed among Turkish dental students.¹⁷

There are various structural differences between state and foundation universities that may affect students' clinical education experiences.¹⁸ In state universities, patient volume is generally higher, and the large number of students may lead to an increased student-to-faculty ratio.¹⁹ In contrast, foundation universities are generally considered to have more advanced clinical equipment and better physical and technical infrastructure.²⁰ Additionally, students at foundation universities may be in a more advantageous financial position to cover the costs of materials and equipment required for clinical practice.²¹ These structural differences are among the key factors that may influence the stress levels experienced by students during their education.²²

There are a limited number of studies evaluating stress factors among dental students in Türkiye, and it is particularly noteworthy that the differences between students at state and foundation universities have not been sufficiently explored. In this context, evaluating the stress levels of students studying at dental faculties in Türkiye is of great importance, both in terms of contributing to the existing literature and developing student support programs. The aim of this study was to

examine the stress levels and the primary sources of stress among fourth- and fifth-year dental students undergoing clinical education at state and foundation universities in Türkiye. The null hypothesis (H_0) of the study was that there would be no significant difference between the stress levels of dental students based on the type of university, whether state or foundation.

MATERIALS AND METHODS

This study was conducted in collaboration between the state university Çanakkale Onsekiz Mart University Faculty of Dentistry and the foundation university Beykent University Faculty of Dentistry. The study population consisted of fourth- and fifth-year students enrolled in the Faculty of Dentistry at Çanakkale Onsekiz Mart University and Beykent University during the 2024-2025 academic year. The data were collected in April 2025. A total of 141 female and 57 male students, including 100 fourth-year and 98 fifth-year students, participated in the study. Only those who voluntarily agreed to participate and completed the survey were included. Students who did not provide informed consent or submitted incomplete responses were excluded. This study was approved by the Health Sciences Ethics Committee of Çanakkale Onsekiz Mart University (Approval no: 01/05; Date: April 09, 2025).

An online survey form was used for data collection. Participants were informed about the study in writing through the online survey invitation, and their consent was obtained. The first part of the survey form included questions aimed at evaluating the demographic characteristics of the participants, followed by 30 modified DES questions to identify the sources of stress.¹⁷ The DES items were presented in Table 1. A 4-point Likert scale was used to answer the DES questions: "1=not stressful, 2=slightly stressful, 3=moderately stressful, 4=very stressful." The survey form was sent to dental school students via <https://docs.google.com/forms/>.

Statistical Analysis

In this study, descriptive statistics of the data (frequency, percentage, mean, SD, median, minimum, and maximum) were provided. The reliability of the scale used in the study was tested. The assumption of normal distribution was checked using the Shapiro-Wilk test. The Mann-Whitney *U* test was applied to compare 2 independent groups. The Pearson chi-square test was applied to test the relationship between categorical variables when the sample size assumption (expected value >5) was met, and Fisher's exact test was used when the sample size assumption was not met. The analyses were performed using IBM SPSS 27 software.

RESULTS

Regarding the demographic characteristics of the participants, 71.2% were female, 28.8% were male, 59.1% were

Table 1. Dental Environment Stress Questionnaire

Stress Factors	Stress Factors Description
1	Amount of classwork
2	Difficulty of manual dexterity
3	Examinations and grades
4	Difficulty in learning precision manual skills required in preclinical and laboratory practice
5	Atmosphere created by preclinical and/or clinical staff
6	Atmosphere created by clinical professors
7	Lack of confidence to be a successful dental student
8	Lack of confidence to be a successful dentist
9	Peer competition
10	Risk of infectious diseases (Hepatitis B Virus (HBV), Human Immunodeficiency Virus (HIV), etc.)
11	Rules/regulations of the dental faculty and administrative responses to student needs
12	Fear of failing the year
13	Fear of not having possibility to pursue a postgraduate program
14	Fear of unemployment after graduation
15	Parent–student relationship
16	Lack of time for relaxation and recreation
17	Lack of home atmosphere in living hostel
18	Dating relationships
19	Financial responsibilities
20	Physical health of family members/personel
21	Difficulty in engagement /marital relationship
22	Difficulty in learning clinical procedures
23	Completion of clinical and graduation requirements
24	Lack of confidence in clinical decision making
25	Shortage of allocated clinical time
26	Differences in opinion between clinical staff concerning patient treatment
27	Responsibility for comprehensive patient care
28	Patients' attitudes toward dentistry
29	Difficulty of classwork
30	Working on patients with poor oral hygiene

studying at state universities, and 40.9% were studying at foundation universities. 50.5% of the participants were fourth-year students, and 49.5% were fifth-year students. The participants' ages ranged from 20 to 32, with a mean age of 23.10 ± 1.50 (median 23). The distribution of demographic characteristics according to the type of university attended by the participants was presented in Table 2.

A reliability analysis was conducted to test the consistency of the scale based on the responses provided by the participants. The Cronbach's alpha reliability coefficient of 0.928 calculated for the DES indicated very high reliability. When the total stress scores were examined according to university type, the total stress level of students at state universities (mean = 89.03 ± 15.53 ; median = 90) was found to be significantly higher compared to those at foundation universities (mean = 81.23 ± 15.92 ; median = 84) (test statistic = -2.909 ; $P = .004$).

The distribution of item-level response percentages, mean scores, SDs, and significance levels between state and foundation university students were presented in Table 3. Among the 30 items of the DES, statistically significant differences were observed in 13 specific items between state and foundation university students. These items were amount of classwork (item 1), examinations and grades (item 3), atmosphere created by preclinical and/or clinical staff (item 5), atmosphere created by clinical professors (item 6), rules and administrative responses (item 11), fear of failing the year (item 12), lack of time for relaxation and recreation (item 16), financial responsibilities (item 19), completion of clinical and graduation requirements (item 23), shortage of allocated clinical time (item 25), differences in opinion between clinical staff (item 26), difficulty of classwork (item 29), and working on patients with poor oral hygiene (item 30).

DISCUSSION

In this study, the stress levels of dental students at state and foundation universities were evaluated. According to the results of the study, when the total stress scores were examined by university type, it was found that the total stress levels of students at state universities were significantly higher compared to those at foundation universities. At the same time, in the 30-item DES questionnaire, significant differences were found in the stress levels of students at state and foundation universities for 13 items. As a result, the null hypothesis, which stated that there would be no significant difference in the stress levels of dental students based on the type of university they attend, was rejected.

The Turkish version of the DES used in this study is an instrument that has previously been validated and proven reliable. In the study conducted for the adaptation of the scale into Turkish, the Cronbach alpha coefficient was reported as

Table 2. Distribution of Demographic Characteristics According to the Type of University Attended and the Relationships Between Them

		State University			Foundation University			Test Statistic	P
		n	%	T (%)	n	%	T (%)		
Gender	Female	77	54.6	65.8	64	45.4	79.0	4.068	.044*
	Male	40	70.2	34.2	17	29.8	21.0		
Year of study	Fourth year	55	55.0	47.0	45	45.0	55.6	1.399	.237
	Fifth year	62	63.3	53.0	36	36.7	44.4		

* $P < .05$.

**Fisher's exact test.

Table 3. Distribution of Item-Level Response Percentages, Mean Scores, SDs, and Significance Levels Between State and Foundation University Students

	State University					Foundation University					
	Distribution of Replies (%)					Distribution of Replies (%)					
	1	2	3	4	Mean (SD)	1	2	3	4	Mean (SD)	P
1.	0	3.4	32.5	64.1	3.61 (0.56)	0	9.9	55.6	34.6	3.25 (0.62)	.000
2.	7.7	26.5	38.5	27.4	2.85 (0.91)	12.3	17.3	48.1	22.2	2.80 (0.93)	.80
3.	0	4.3	18.8	76.9	3.73 (0.54)	2.5	14.8	39.5	43.2	3.23 (0.79)	.000
4.	4.3	23.1	34.2	38.5	3.07 (0.89)	4.9	17.3	51.9	25.9	2.99 (0.80)	.419
5.	0.9	16.2	29.9	53.0	3.35 (0.78)	9.9	33.3	39.5	17.3	2.64 (0.88)	.000
6.	0.9	5.1	26.5	67.5	3.61 (0.63)	8.6	22.2	37.0	32.1	2.93 (0.95)	.000
7.	10.3	23.9	32.5	33.3	2.89 (0.99)	13.6	11.1	44.4	30.9	2.93 (0.98)	.744
8.	12	17.9	41.0	29.1	2.87 (0.97)	9.9	21	39.5	29.6	2.89 (0.95)	.953
9.	23.1	29.9	28.2	18.8	2.43 (1.04)	23.5	32.1	29.6	14.8	2.36 (1.00)	.658
10.	14.5	20.5	40.2	24.8	2.75 (0.99)	7.4	29.6	32.1	30.9	2.86 (0.95)	.513
11.	2.6	15.4	29.1	53.0	3.32 (0.83)	6.2	25.9	45.7	22.2	2.84 (0.84)	.000
12.	2.6	3.4	17.9	76.1	3.68 (0.67)	8.6	18.5	30.9	42.0	3.06 (0.98)	.000
13.	6.8	14.5	39.3	39.3	3.11 (0.90)	6.2	14.8	42.0	37.0	3.10 (0.87)	.853
14.	7.7	12.8	34.2	45.3	3.17 (0.93)	7.4	21.0	29.6	42.0	3.06 (0.97)	.422
15.	17.2	23.3	25.0	34.5	2.77 (1.11)	17.3	25.9	33.3	23.5	2.63 (1.03)	.330
16.	5.1	7.7	24.8	62.4	3.44 (0.85)	6.2	18.5	40.7	34.6	3.04 (0.89)	.000
17.	15.4	18.8	24.8	41.0	2.91 (1.10)	4.9	29.6	42	23.5	2.84 (0.84)	.308
18.	62.4	20.5	6.8	10.3	1.65 (0.99)	58	23.5	16	2.5	1.63 (0.84)	.714
19.	8.5	17.1	31.6	42.7	3.09 (0.97)	16	37	29.6	17.3	2.48 (0.96)	.000
20.	7.7	22.2	33.3	36.8	2.99 (0.95)	12.3	23.5	42	22.2	2.74 (0.95)	.063
21.	58.1	17.1	11.1	13.7	1.80 (1.10)	40.7	27.2	21	11.1	2.02 (1.04)	.06
22.	7.7	30.8	29.1	32.5	2.86 (0.96)	13.6	29.6	35.8	21	2.64 (0.97)	.129
23.	16.2	27.4	29.1	27.4	2.68 (1.05)	30.9	24.7	30.9	13.6	2.27 (1.05)	.01
24.	13.7	26.5	35	24.8	2.71 (0.99)	13.6	27.2	37	22.2	2.68 (0.97)	.818
25.	5.1	12.8	40.2	41.9	3.19 (0.85)	24.7	27.2	32.1	16	2.240 (1.03)	.000
26.	5.1	11.1	25.6	58.1	3.37 (0.88)	14.8	32.1	25.9	27.2	2.65 (1.04)	.000
27.	6	16.2	42.7	35	3.07 (0.87)	9.9	12.3	45.7	32.1	3.00 (0.92)	.686
28.	34.2	25.6	27.4	12.8	2.19 (1.05)	30.9	33.3	24.7	11.1	2.16 (0.99)	.900
29.	4.3	19.7	25.6	50.4	3.22 (0.91)	9.9	28.4	42	19.8	2.72 (0.90)	.000
30.	17.9	20.5	37.6	23.9	2.68 (1.03)	18.5	40.7	23.5	17.3	2.40 (0.98)	.042

0.919, indicating a high level of internal consistency.¹⁷ The Cronbach alpha coefficient obtained in this study was 0.928, further demonstrating that the scale was highly reliable, consistent with previous findings.

Studies found that the average DES scores of clinical-year students were higher compared to those of students in preclinical education.^{23,24} This difference was suggested to be related to the stress experienced during patient treatment and concerns about their professional future. In this context, the stress levels of students undergoing clinical training were examined in the present study. Students in the clinical stage bear more responsibility due to patient treatment and practical requirements, which may lead to an increase in their stress levels. Additionally, although students may develop their ability to cope with the challenges they face as they gain clinical experience, factors such as the intense clinical workload and concerns about their professional future may affect their stress levels.

The main causes of stress among dental students include exams, clinical requirements, communication with patients, financial difficulties, limited rest time, and faculty conditions.²⁵ In a study conducted with 1294 students from 3 different state universities in Türkiye, the fear of failing a course or losing a year due to incomplete clinical practices was found to be the highest stress factor.²⁶ Another study also reported that the fear of failing a course or losing a year is one of the most significant sources of stress for dental students.²⁷

In this study, the factors that cause the most stress among dental students at state universities were identified as "examinations and grades" and "fear of failing the year." These findings supported the notion that academic performance pressure and the fear of losing a year, which have been emphasized in previous studies, are significant sources of stress, particularly for dental students attending state universities.

When the stress levels of dental students attending foundation universities were evaluated, it was found that financial responsibilities were not as significant stress factors as expected.²⁷ In this study, "financial responsibilities" caused more stress for dental students at state universities, while it did not cause the same level of stress in foundation universities that charge tuition fees. This situation may be related to the fact that students enrolled in foundation universities may have the financial means to cover their tuition fees. Additionally, it is suggested that the provision of consumables used during clinical training by some foundation universities may have reduced the financial pressure on students.

In this study, although the factor that caused the most stress for dental students at foundation universities was identified as the "amount of classwork," it was observed that this factor led to higher levels of stress among students at state universities. Additionally, stress factors such as "atmosphere created by preclinical and/or clinical staff," "atmosphere created by clinical professors," "differences in opinion between clinical staff concerning patient treatment," and "rules/regulations of the dental faculty and administrative responses to student needs" were also reported at higher levels by dental students at state universities. This may suggest that clinical staff at state universities apply stricter rules to students, and that students are in a more pressuring educational environment. Additionally, the relatively larger size of clinical staff at state universities may increase disagreements during the patient treatment process, leading to higher stress levels among students.

At the same time, factors such as "completion of clinical and graduation requirements" and "shortage of allocated clinical time" were also causing higher levels of stress among students at state universities. This situation may be due to the high patient quotas and the large number of students at state universities, which limit clinical usage time for each student. Increased clinical workload and pressure to complete quotas may lead to students being unable to find enough time for rest and socializing, thereby increasing stress levels associated with the 'lack of time for relaxation and recreation.'

In a study conducted in Egypt, the perceived stress levels of dental students studying at state and foundation universities were compared, and it was reported that the stress levels of students at state universities were approximately 7 times higher than those of students at foundation universities.²⁸ The same study reported that the most frequently cited source of stress by students in both university groups was the "amount of classwork." In another study conducted in Malaysia, it was reported that state university students had higher DES scores compared to foundation university students, and the most common source of stress was the "fear of failing end-of-year examinations."²⁹ Additionally, foundation university students reported feeling less financial pressure despite the high tuition fees, similar to the findings of

the present study. Similarly, in the present study, "examinations and grades" and "fear of losing a year" emerged as the most prominent stress factors among state university students, while "amount of classwork" was identified as a more significant source of stress for foundation university students. These findings indicate that the results of the current study are consistent with similar research in the literature and demonstrate that the commonly observed sources of stress among dental students have been reported in a similar manner across different countries.

It can be considered that the nature of the dental profession, which inherently involves a certain level of stress, positively contributes to a dentist's ability to perform as expected both during their education and in their professional career. However, an excessive increase in stress levels can lead to negative outcomes.²⁵ This situation highlights the necessity of controlling and reducing stress. A literature review covering studies on stress management programs for dental students emphasized the importance of organizing educational programs to reduce existing stress factors and utilizing helpful relaxation techniques.³⁰

In the literature, most studies evaluating the impact of dental education on students' stress levels have been conducted using a cross-sectional data collection method. Similarly, in this study, data were collected over a specific period, and a longitudinal design examining changes in students' stress levels throughout their entire educational process was not adopted. Additionally, since the research was conducted at only 1 state and 1 foundation university, the generalizability of the findings to all dental students is limited. Therefore, future studies conducted with larger sample sizes and long-term designs, covering more dental faculties from different geographical regions, are expected to provide a more comprehensive understanding of the factors affecting students' stress levels.

CONCLUSION

In this study, it was found that the stress levels of dental students at state universities were higher compared to those at foundation universities. According to the results, students were experiencing high levels of stress due to factors such as academic performance pressure, course load, exams, grades, and the fear of losing a year. Based on these findings, it is suggested that changes could be made in the educational programs, particularly in state universities, to reduce students' stress levels. Support programs and counseling services related to exam processes could be developed in education, thereby strengthening students' skills to cope with academic pressures. Additionally, training sessions on stress management techniques could be organized to reduce the pressures during clinical training. In the future, examining this issue with larger samples and long-term studies would contribute to the development of more effective approaches for stress management.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author.

Ethics Committee Approval: Ethical committee approval was received from the Health Sciences Ethics Committee of Çanakkale Onsekiz Mart University (Approval No.: 01/05; Date: April 09, 2025).

Informed Consent: Written informed consent was obtained from students who participated in this study.

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