



## Scientific Research Report

## Major Stress Sources Amongst Dental Students at Damascus University, Syria

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## ABSTRACT

**Introduction:** Stress amongst dental students is frequently reported. Various environmental, socioeconomic, and cultural factors affect students' perceived stress levels. The aim of this study was to investigate stress levels and sources amongst undergraduate dental students at Damascus University, Syria.

**Methods:** A cross-sectional design was used. A questionnaire was undertaken in 2019 at the Faculty of Dentistry at Damascus University. Students participated voluntarily in the survey. The sample comprised students at the preclinical and clinical stage. A modified 29-item version of the validated Dental Environmental Stress (DES) questionnaire with a 5-point scale (1 = not stressful to 5 = extremely stressful) was used as the measurement tool. Ethical approval was granted by Damascus University.

**Results:** In all, 365 students participated in the study, with a response rate of 96% (365/379). Cronbach's alpha was 0.83, indicating good reliability of the measurement tool. The overall mean score of the perceived stress was 2.64 (95% confidence interval [CI], 2.5-2.7). The mean scores for clinical factors, academic work, educational environment, personal factors, and living accommodation were 3.22 (95% CI, 3.1-3.3), 3.17 (95% CI, 3.1-3.2), 2.99 (95% CI, 2.9-3.0), 2.15 (95% CI, 2.1-2.2), 2.15 (95% CI, 2.0-2.2), respectively. The specific stressors with the highest mean scores were lack of dental equipment and difficulty in finding requested clinical cases; the respective means were 4.1 (95% CI, 4.0-4.2) and 3.9 (95% CI, 3.8-4.0).

**Conclusions:** The findings revealed moderate stress levels amongst students. The major stress factors pertained to stressors from the clinical, academic, and educational environment domains. Certain clinical and environmental stressors, such as difficulty in finding clinical cases and lack of dental equipment, were more powerful than the strongest academic stressors, such as examinations and grades and amount of assigned work.

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## Introduction

Stress is a well-observed phenomenon amongst dental students.<sup>1,2</sup> During their years of education, they are exposed to multiple stress factors such as heavy workloads, schedule pressure, and the need to manage learning basic knowledge and

mastering technical clinical skills. In the clinical stage, additional stressors emerge such as dealing with patients, patient care responsibility, and difficulty in obtaining manual skills.<sup>3</sup> Eventually, the excessive levels of stress, if not managed, could lead to poor academic performance, serious psychological issues, lower levels of motivation, and even dropouts.<sup>4,5</sup>

Various environmental, socioeconomic, and cultural factors could mitigate, exacerbate, or modify students' perceived stress.<sup>6</sup> In politically unstable areas, there are numerous direct and indirect factors affecting students' stress levels.<sup>7</sup> Some countries in the Arab world, such as Yemen, Libya, and Syria, that went into civil war after the so-called "Arab

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Spring” experienced considerable political, social, and economic instability. In Syria, the effects of ongoing political conflict extended to dental schools, resulting in the deterioration of training and education quality at most universities. The Faculty of Dentistry at Damascus University is currently greatly lacking in terms of teaching staff, dental materials, and equipment. Many dental supplies that students use to treat patients are in poor condition and malfunctional.<sup>8</sup> The educational attention students receive during clinical practice is minimal due to the huge number of students, which was the result of major internal displacement from conflict areas to Damascus.<sup>9</sup> Furthermore, finding patients and treating them within a limited time in a poorly equipped facility makes the educational experience for Syrian dental students much more difficult and stressful than in dental schools in other developed countries.

A study in Yemen in 2019 revealed moderate to high stress levels amongst dental students associated with workload and war-related stressors.<sup>10</sup> Another study, in Libya, showed that dental students living in a conflict-free zone had higher levels of stress in comparison to their counterparts living in war zones.<sup>11</sup> These results were attributed to the low importance of dental school stress in active-conflict areas. Damascus Governorate is a conflict-free zone in Syria; however, there are some indirect effects of war as illustrated above that have affected dental students’ academic and personal lives.

There have been no studies in Syria that have highlighted stress magnitude and related factors amongst dental students. Exposing major stressors is important, especially in contexts like Syria. This could aid the Faculty of Dentistry to direct its efforts to lowering stress levels amongst students, thereby mitigating the harmful impact of stress on the mental health and academic performance of the student body. To this end, this study set out to explore stress levels and determine its major sources amongst undergraduate dental students at Damascus University.

## Methods and materials

Ethical approval was granted by the ethical committee at the Faculty of Dentistry, Damascus University. Participation in this study was voluntary and confidential, and the reported findings do not compromise respondents’ confidentiality. The research study was undertaken in accordance with the Declaration of Helsinki.

### Study design

This is a cross-sectional observational study. A paper questionnaire survey was administered in the academic year 2018/2019 during March and April in 2019 at the Faculty of Dentistry, Damascus University, which is considered the largest dental faculty in Syria.

### Settings and participants

Students in Syria enroll in the Dental Medicine programme at Damascus University directly after high school. The Dental Medicine bachelor’s degree programme is 5 years long; the first

3 years are preclinical years in which students study basic health sciences and practice dental procedures on phantom heads. In the 4th and 5th years, dental students go through extensive clinical practice, which is undertaken on real patients.

The study participants were 3rd-, 4th-, and 5th-year students with an age range between 20 and 24 years. Convenience sampling (nonprobability sampling method) was used to recruit participants. Nevertheless, precautions were taken to minimise selection bias. Students in each year of study are divided by the university into different classes (usually about 10 classes) that practice at clinical departments during different periods. We collected data from different classes in each year of study to minimise potential bias. In addition, a relatively large sample was collected to limit the effect of outliers and extreme observations.

The defined population comprised 2534 students. A total number of 365 students participated in the study, with a response rate of 96% (365/379); 212 (58%) were female. In terms of year of study, 95 (25.8%) students were 3rd year, 133 (36.4%) were 4th year, and 138 (37.8%) were 5th year.

### Data collection

The variable of interest was stress amongst dental students and sex and year of study were treated as independent variables. A modified version of the validated Dental Environmental Stress (DES) questionnaire was used to collect data, as it is the most commonly used tool for measuring stress amongst dental students.<sup>12-14</sup> After the DES questionnaire was translated into Arabic by qualified translators, a panel of experts checked its face validity and approved it. Thereafter, it was pretested with 25 dental students at Damascus University to check the validity and clarity of items. The pretest helped refine the questionnaire by increasing items’ clarity by rephrasing some statements, and some items were deleted due to lack of context specificity (dependency on alcohol and drugs); all questionnaire items were adopted from 2 versions of the DES questionnaire that were used in previous studies<sup>11,15</sup> except for one item: lack of dental equipment, which was generated according to the pretest sample’s recommendations.

Items were under 5 distinct stress domains: academic work (5 items), clinical factors (8 items), educational environment (6 items), personal factors (7 items), and living accommodations (2 items).<sup>16</sup> A 5-point Likert scale ranging from 1 (not stressful) to 5 (extremely stressful) was used. Although the subpopulation of 3rd-year students is not exposed to clinical work yet, they were included in the study to compare stress levels between preclinical- and clinical-stage students, as one previous study did.<sup>15</sup>

### Data analysis

Microsoft Excel (Microsoft) was used for data processing and data chart generation. IBM SPSS version 26.0 (IBM Corp) was used to analyse the data. Descriptive statistics (mean, 95% confidence interval [CI]) were used to identify major stressors and their perceived magnitude. Independent sample t test was used to measure the differences between sex, and one-way analysis of variance (ANOVA) was used to analyse the

**Table 1 – Mean scores on a 5-point scale for each domain according to sex and year of study.**

Stress domain	Sex		P value	<i>d</i>	Academic year			P value	$\eta^2$	Total	
	Male (n = 153)	Female (n = 212)			3rd (n = 94)	4th (n = 133)	5th (n = 138)				
	M (95% CI)	M (95% CI)			M (95% CI)	M (95% CI)	M (95% CI)				
Academic work	3.07 (2.9-3.2)	3.24 (3.2-3.4)	.01	0.26	2.99 (2.8-3.1)	3.20 (3.0-3.3)	3.25 (3.1-3.3)	.009	0.02	3.17 (3.1-3.2)	
Clinical factors	3.07 (2.9-3.1)	3.34 (2.2-3.4)	.001	0.46	-	3.17 (3.0-3.2)	3.22 (3.1-3.3)	.181	0.01	3.22 (3.1-3.3)	
Educational environment	2.95 (2.8-3.0)	3.0 (2.9-3.1)	.38	-0.09	2.70 (2.5-2.8)	3.00 (2.8-3.1)	3.09 (3.0-3.1)	<.001	0.06	2.99 (2.9-3.0)	
Personal factors	2.18 (1.9-2.2)	2.13 (2.1-2.5)	.51	0.07	2.11 (1.9-2.2)	2.02 (1.9-2.1)	2.30 (2.1-2.4)	.004	0.03	2.15 (2.1-2.2)	
Living accommodations	2.13 (2.0-2.3)	2.16 (2.0-2.3)	.76	0.03	1.95 (1.7-2.1)	2.03 (1.8-2.2)	2.40 (2.2-2.6)	.003	0.03	2.15 (2.0-2.2)	

1 = not stressful, 5 = extremely stressful.

A P value <.05 is considered statistically significant. *d* (Cohen's *d*) and  $\eta^2$  (Eta-squared) are measures of effect size.

difference between students from different years of study. Cohen's *d* and Eta-squared were used for measuring the effect size in the previous 2 tests, respectively. Cronbach's alpha was used to measure the internal consistency of the measurement tool.

**Results**

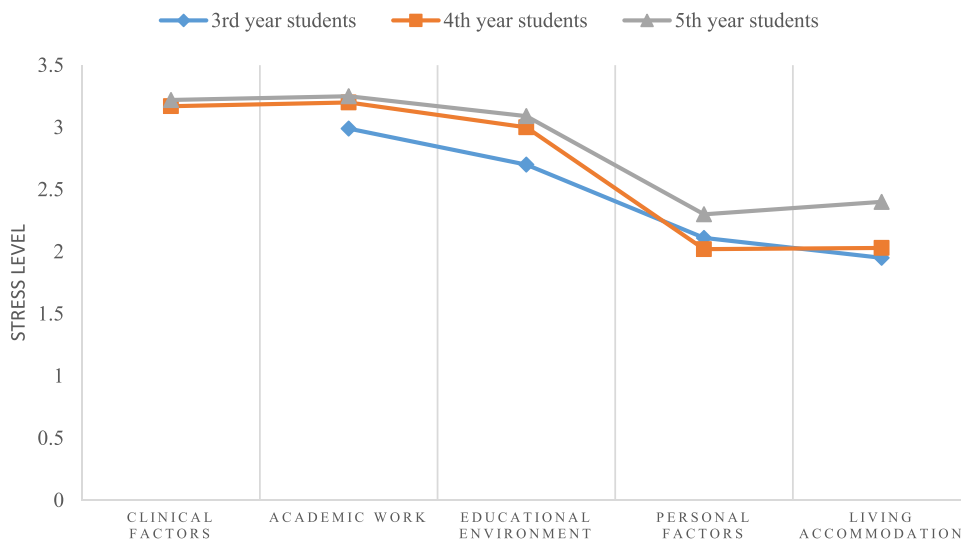
Cronbach's alpha was 0.83, and this indicates good overall reliability of the items in the questionnaire. After confirming the normality of data and other test assumptions, independent sample t test and one-way ANOVA were performed.

Table 1 shows the mean scores for stressors as per each domain (academic, clinical, educational environment, personal, living accommodation) according to sex and year of study. The major stress domains were clinical factors, academic work, and educational environment, respectively.

Female students had higher stress scores across most domains, with a statistically significant difference in 2 domains: academic work ( $P = .01, d = 0.26$ ) and clinical factors ( $P = .001, d = 0.46$ ; Table 1).

In regard to students' year of study, there was a statistically significant difference amongst each subgroup in all domains with the exception of the clinical domain. Eta-squared showed that the effect size was small ( $\eta^2 < 0.06$ ) across all domains except for educational environment; the Figure provides a visual comparison between 3rd-, 4th-, and 5th-year students according to their responses in each stress domain.

A detailed view of each stressor is provided in Table 2; stressors are ordered according to their scores from highest to lowest in each domain. In the academic work domain, examinations and grades and the amount of assigned work were the most stressful. In the clinical factors domain, difficulty in finding requested clinical cases and patients being late to appointments were very strong stressors. In the educational environment domain, lack of dental equipment in comparison to the number of students was the strongest stressor, with a statistically significant difference amongst students of different years of study and medium effect size ( $P = .001, \eta^2 = 0.06$ ). Stressors related to personal factors and living accommodation had the lowest mean scores in comparison to other domains, with lack of time for relaxation and financial responsibilities being the highest-score stressors in



**Fig – Line graph comparing students mean scores of 3rd-, 4th-, and 5th-year students on each stress domain according to the Dental Environment Stress (DES) questionnaire.**

**Table 2 – Stressors mean scores on a 5-point scale according to sex and year of study.**

Rank	Stressors according to their domain	Sex		P value	d	Year of study			P value	$\eta^2$	Total n (365) M (95%CI)
		Male (n = 153) M (95% CI)	Female (n = 212) M (95% CI)			3rd (n = 94) M (95% CI)	4th (n = 133) M (95% CI)	5th (n = 138) M (95%CI)			
<b>Academic work</b>											
1	Examinations and grades	3.5 (3.3-3.7)	3.7 (3.9-3.9)	.04	0.21	3.8 (3.5-4.0)	3.5 (3.4-3.7)	3.7 (3.5-3.9)	.24	0.01	3.6 (3.5-3.7)
2	Amount of assigned work	3.4 (3.3-3.5)	3.5 (3.3-3.6)	.54	0.06	3.2 (3.0-3.3)	3.5 (3.3-3.6)	3.6 (3.4-3.7)	<.001	0.03	3.5 (3.4-3.6)
3	Uncertainty about job opportunities and dental career	3.1 (2.8-3.3)	3.4 (3.2-3.6)	.30	0.11	2.6 (2.4-2.9)	3.3 (3.1-3.6)	3.2 (3.0-3.4)	.001	0.04	3.3 (3.1-3.4)
4	Assignments difficulty	2.9 (2.8-3.0)	3.2 (3.1-3.3)	.004	0.30	2.9 (2.8-3.1)	3.1 (2.9-3.3)	3.1 (3.0-3.3)	.25	0.01	3.1 (3.0-3.2)
5	Competition with peers	2.8 (2.6-3.1)	2.7 (2.5-2.9)	.41	0.08	2.6 (2.3-2.8)	2.7 (2.5-2.9)	3.0 (2.7-3.2)	.06	0.01	2.8 (2.7-3.0)
6	Fear of failing course or year	2.5 (2.3-2.8)	3.0 (2.8-3.2)	.003	0.31	2.8 (2.5-3.1)	2.8 (2.6-3.1)	2.8 (2.5-3.0)	.92	0.001	2.8 (2.6-3.0)
<b>Clinical factors</b>											
1	Difficulty in finding requested clinical cases	3.7 (3.6-3.9)	4.0 (3.8-4.1)	.06	0.23		4.0 (3.8-4.2)	3.8 (3.6-3.9)	.23	0.01	3.9 (3.8-4.0)
2	Patient being late or absent to an agreed upon appointment	3.6 (3.4-3.8)	3.7 (3.5-3.8)	.51	0.08		3.5 (3.3-3.7)	3.8 (3.6-3.9)	.01	0.02	3.6 (3.5-3.8)
3	Discordance between different faculty members in assessment	3.5 (3.3-3.7)	3.57 (3.3-3.7)	.67	0.05		3.4 (3.2-3.6)	3.6 (3.4-3.8)	.15	0.01	3.5 (3.4-3.7)
4	Patients dropping out	3.3 (3.0-3.5)	3.5 (3.3-3.6)	.13	0.18		3.3 (3.1-3.5)	3.4 (3.3-3.7)	.17	0.005	3.4 (3.2-3.5)
5	Dealing with patients of poor hygiene awareness	2.7 (2.5-3.0)	3.5 (3.3-3.7)	<.001	0.66		3.3 (3.1-3.5)	3.1 (2.9-3.3)	.38	0.007	3.2 (3.0-3.3)
6	Patient care responsibility	2.8 (2.6-3.0)	3.1 (2.9-3.3)	.06	0.23		2.8 (2.6-3.0)	3.1 (2.9-3.3)	.06	0.01	3.0 (2.8-3.1)
7	Difficulty in learning clinical treatment approaches	2.5 (2.3-2.7)	2.7 (2.6-2.9)	.07	0.22		2.6 (2.4-2.7)	2.7 (2.5-2.9)	.40	0.001	2.6 (2.5-2.8)
8	Difficulty in learning manual skills	2.2 (2.0-2.4)	2.4 (2.3-2.6)	.07	0.22		2.3 (2.1-2.5)	2.4 (2.2-2.6)	.50	0.001	2.3 (2.2-2.5)
<b>Educational environment</b>											
1	Lack of dental equipment in comparison to the number of students	4.0 (3.8-4.2)	4.2 (4.1-4.3)	.08	0.08	3.68 (3.4-3.9)	3.9 (3.8-4.1)	4.3 (4.1-4.5)	.001	0.06	4.1 (4.0-4.2)
2	Expectations versus reality of dental education	3.0 (2.7-3.2)	3.2 (3.0-3.4)	.18	0.14	2.6 (2.4-2.9)	3.1 (2.9-3.4)	3.1 (2.9-3.3)	.01	0.02	3.1 (2.9-3.2)
3	Being criticised during clinical work	2.8 (2.6-3.0)	3.3 (3.1-3.5)	.003	0.31	3.09 (2.8-3.3)	2.9 (2.7-3.2)	3.2 (3.0-3.4)	.19	0.01	3.1 (2.9-3.2)
4	Academic atmosphere created by the faculty	2.9 (2.7-3.1)	2.8 (2.6-3.0)	.31	0.11	2.4 (2.1-2.6)	2.8 (2.6-3.0)	3.1 (2.9-3.4)	<.001	0.05	2.9 (2.8-3.1)
5	Policy and rules imposed by the faculty	2.5 (2.3-2.7)	2.6 (2.4-2.8)	.48	0.07	2.2 (1.9-2.4)	2.6 (2.4-2.9)	2.8 (2.6-3.1)	<.001	0.04	2.7 (2.6-2.9)
6	Discrimination based on sex or ethnicity	2.6 (2.3-2.8)	2.3 (2.0-2.5)	.17	0.14	2.1 (1.8-2.4)	2.4 (2.1-2.6)	2.4 (2.1-2.6)	.27	0.01	2.4 (2.2-2.6)
<b>Personal factors</b>											
1	Lack of time for relaxation and leisure activities	3.1 (2.9-3.3)	3.4 (3.2-3.6)	.22	0.13	3.0 (2.7-3.3)	3.3 (3.0-3.5)	3.3 (3.0-3.5)	.19	0.01	3.3 (3.1-3.4)
2	Financial responsibilities	3.0 (2.8-3.2)	2.8 (2.6-3.0)	.07	0.19	2.6 (2.3-2.9)	2.7 (2.5-2.9)	3.1 (2.9-3.3)	.01	0.02	2.9 (2.7-3.0)
3	Having multiple roles (husband/wife/responsible for providing for family)	1.8 (1.6-2.0)	1.8 (1.6-2.0)	.81	0.02	1.8 (1.6-2.1)	1.5 (1.3-1.7)	2.0 (1.8-2.3)	.002	0.03	1.8 (1.6-1.9)
4	Emotional relationships	1.9 (1.7-2.1)	1.8 (1.6-2.0)	.22	0.13	1.8 (1.6-2.0)	1.8 (1.6-2.0)	1.9 (1.7-2.1)	.56	0.003	1.8 (1.7-2.0)
5	Personal health issues	1.8 (1.6-2.0)	1.8 (1.6-2.0)	.55	0.06	1.7 (1.5-1.9)	1.7 (1.5-1.9)	1.9 (1.7-2.1)	.38	0.005	1.8 (1.7-1.9)
6	Socialising with peers	1.6 (1.4-1.8)	1.8 (1.6-1.9)	.16	0.15	1.7 (1.5-1.9)	1.5 (1.3-1.6)	1.9 (1.7-2.0)	.008	0.02	1.7 (1.6-1.8)
7	Postponing marriage/having children	1.7 (1.5-1.9)	1.6 (1.5-1.9)	.30	0.11	1.9 (1.6-2.1)	1.5 (1.3-1.7)	1.9 (1.6-2.1)	.02	0.02	1.7 (1.5-1.8)
<b>Living accommodation</b>											
1	Living away from home	2.3 (2.0-2.6)	2.6 (2.4-3.0)	.62	0.05	2.1 (1.8-2.4)	2.2 (2.0-2.5)	2.7 (2.5-3.0)	.002	0.03	2.5 (2.3-2.7)
2	Lack of comfortable atmosphere at home	1.8 (1.6-2.0)	1.9 (1.7-2.2)	.92	0.01	1.8 (1.6-2.0)	1.8 (1.6-2.0)	2.0 (1.8-2.2)	.22	0.01	1.9 (1.7-2.0)

Stressors are in descending order and grouped according to their respective domain.

1 = not stressful, 5 = extremely stressful.

A P value <.05 is considered statistically significant. d (cohen's d) and  $\eta^2$  (Eta-squared) are measures of effect size.

the personal factor domain. Across the 29 questionnaire items, only small effect sizes were observed between females and males (Cohen's  $d < 0.25$ ), and Eta-squared also showed small effect sizes amongst students of different years of study ( $\eta^2 < 0.06$ ) with the exception of the stressor of lack of dental equipment (Table 2).

Table 3 displays the main 5 stressors of the highest mean scores according to sex and year of study. Overall, the 5 major stressors were the same between students of different sex, and they are very similar to students across years of study with minor differences in their given order for each subgroup. The emerging major stressors were lack of dental school equipment (total mean = 4.1; 95% CI, 4.0-4.2), difficulty in finding requested clinical cases (total mean = 3.9; 95% CI, 3.8-4.0). The t test showed that there is a significant difference ( $t = 4.99$ ,  $P < .001$ ,  $d = -0.22$ ) between the strongest academic stressor, examinations and grades, and the strongest clinical stressor, difficulty in finding patients. There was also a statistically significant difference ( $t = 7.8$ ,  $P < .001$ ) between examination and grades mean score and the strongest educational environment stressor, lack of dental equipment, with a small effect size ( $d = -0.34$ ).

## Discussion

The current study aimed to explore stress factors pertaining to dental education at Damascus University in Syria. To this end, a survey was undertaken to measure students' stress levels and sources amongst dental students using the DES questionnaire. Overall, the results revealed moderate stress levels amongst students. Clinical factors, academic work, and educational environment were the major domains causing stress; other personal and living accommodation factors appeared to have a generally weak effect. The specific stressors that caused a high level of stress did not pertain mostly to the academic domain but rather to the clinical and educational environment domains, such as lack of dental

equipment in comparison to the number of students and difficulty in finding requested clinical cases. Female students experienced higher stress levels than their male counterparts. Stress levels also increased consistently with advancing year of study.

The stress level reported in this study was not very different from other studies conducted in other countries with political conflict such as Libya and Yemen.<sup>10,11</sup> Female students in this study reported higher stress levels than their male counterparts, and this is also consistent with previous studies.<sup>17</sup> The major stressors, however, were different from previous studies, which reported that academic work for pre-clinical and clinical students was generally more stressful than other stress domains,<sup>10,11,15,18</sup> whereas in the current study, stressors relating to clinical factors and educational environment emerged as strong as or stronger than academic stressors.

Examinations and grades as well as the amount of assigned work being the major academic stressors was in concurrence with the findings of other studies.<sup>15,19-22</sup> In contrast to other studies,<sup>21,23</sup> the major clinical stressors were not difficulty in dealing with patients and learning clinical procedures but rather difficulty in finding requested clinical cases and the patient being late or absent for an agreed-upon appointment. In the educational environment domain, the current study findings completely differ from other studies,<sup>24,25</sup> as it reports lack of dental equipment as a major stress factor. According to our knowledge, the lack of dental equipment stressor was not reported as the main stressor in other studies; it appears to be unique to the Syrian context.

The difference in clinical and educational environment stressors can be attributed to the Faculty of Dentistry's inadequate technical capacity in comparison to the huge number of admitted students, which is much greater than the number of patients seeking treatment in the faculty. According to Eastern Mediterranean Health Observatory, the density of graduate dental students in Syria (who mostly graduate from Damascus University) quadrupled in 2020 in comparison to

**Table 3 – The 5 major stressors for each demographic ordered according to their mean score values.**

Rank	Sex		Year of study		
	Male	Female	3rd year	4th year	5th year
1	Lack of dental equipment in comparison to the number of students	Lack of dental equipment in comparison to the number of students	Examinations and grades	Difficulty in finding requested clinical cases.	Lack of dental equipment in comparison to the number of students
2	Difficulty in finding requested clinical cases	Difficulty in finding requested clinical cases	Lack of dental equipment in comparison to the number of students	Lack of dental equipment in comparison to the number of students	Patient being late or absent to an agreed appointment
3	Patient being late or absent to an agreed appointment	Examinations and grades	Amount of assigned work	Examinations and grades	Difficulty in finding requested clinical cases
4	Discordance between different faculty members in assessment	Patient being late or absent to an agreed appointment	Being criticised during clinical work	Patient being late or absent to an agreed appointment	Examinations and grades
5	Examinations and grades	Discordance between different faculty members in assessment	Lack of time for relaxation and leisure activities	Amount of assigned work	Discordance between different faculty members in assessment



2016 and earlier years.<sup>26</sup> The increasing number of dental students also limits each student's access to dental equipment and materials, and the faculty capacity is clearly falling short of meeting students' needs. All these factors make finding requested clinical cases more difficult. In addition, the lack of dental equipment makes treating patients much more challenging.

The state of war has greatly affected the Syrian economy,<sup>27</sup> which could have in turn affected the Faculty of Dentistry budget. This may have rendered providing functional and efficient dental equipment such as dental units, dental x-ray machines, and other necessary items very difficult, not to mention equipment maintenance cost. Nevertheless, war is not the only possible factor contributing to the poor equipment and the lack of thereof. Corruption at Damascus University cannot be ruled out. There have been multiple studies and reports of corruption in Syrian governmental organisations including public universities,<sup>28-30</sup> and there are some unofficial reports of embezzlement of the university supply of dental equipment, which was meant to serve dental students. On the whole, the large number of students, the economic crisis, and corruption are the main proposed explanations for the lack of dental equipment.

The stress experienced by Syrian dental students can be partially explained by the heavy workload, which is further challenged by the limited access to the necessary resources and the responsibility of finding a relatively large number of patients to treat and pass clinical modules.

There are certain implications of these findings for graduating dentists from Damascus University. Due to the large number of graduating dentists, it is expected that many students might find difficulty in entering the job market or establishing their private clinics, as Damascus is provided with a superfluous number of dentists every year. Moreover, many of the graduates who were licensed might not have the necessary knowledge, skill, or experience of using certain dental equipment, as they were not trained with high-quality modern dental equipment during the clinical stage of their education.

To our knowledge, there have been no studies in the literature that reported stress levels and factors amongst Syrian dental students, making the current study valuable to form a better picture of stress amongst dental students in the Eastern Mediterranean area. The novelty of this study lies in the emergence of lack of dental equipment as a major stressor and the powerful impact of clinical factors and educational environment stressors in comparison to academic stressors. The results of this study could guide faculty and administration staff to make interventions that target major stress factors affecting dental students at Damascus University and therefore improve psychological well-being and limit the main consequences of high stress levels such as poor academic performance,<sup>14</sup> anxiety,<sup>31</sup> burnout,<sup>32, 33</sup> and other biological repercussions.<sup>13</sup> This study could also help guide dental educational staff in other low-income countries whose situation is similar to Syria about the potential stress factors that might be affecting their students. The main limitation of this study was using nonprobability sampling; however, the precautions taken to limit bias and the large sample size support the generalisability of the collected data in the defined

population. Future research should focus on how educational and clinical stressors affect dental students' academic and clinical performance at Damascus University.

## Conclusions

Returning to the question posed at the beginning of the study, dental students at Damascus University reported moderate stress levels, with the main stressors being lack of dental equipment and difficulty in finding clinical cases, respectively.

## Ethics approval and consent to participate

The study was approved by the ethical committee at the Faculty of Dentistry. All students participated willingly, confidentiality was assured, and the reported data do not compromise participants' confidentiality.

## Availability of data and materials

The data sets used and/or analysed during the current study are available from the corresponding author on reasonable request.

## Conflict of interest

None disclosed.

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