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Psychological Stress Among Preclinical and Clinical Dental Students: Patterns, Gender Differences, and Academic Stage Variations

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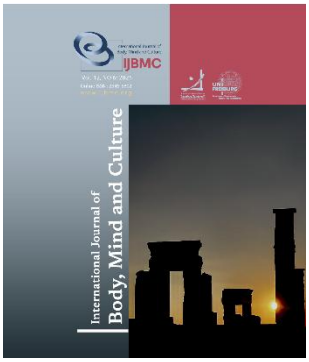

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ABSTRACT

Objective: This study aimed to assess psychological stress levels among preclinical and clinical dental students at Ahl-Albayt University, Karbala, Iraq, and to identify variations in stress patterns according to gender and academic stage.

Methods and Materials: A cross-sectional study was conducted during the second semester of the 2023–24 academic year, involving 315 dental students (211 females, 104 males) from first to fifth academic years. The Dental Environment Stress (DES) questionnaire, adapted to the local context, was used to evaluate stress across three domains: personal factors, educational environment, and clinical training. Responses were rated on a 4-point Likert scale. Data were analyzed using the Kolmogorov–Smirnov test for normality, the Mann-Whitney U test for gender comparisons, and the Kruskal–Wallis test with pairwise comparisons for stage-related differences. A p-value <0.05 was considered significant.

Findings: No significant difference was found in total stress scores between males and females; however, females reported higher stress in patient interactions and examination workload ($p<0.05$). Stress was moderate in early academic stages, peaked in middle years due to family health concerns and exam anxiety, and remained high in final years because of accumulated workload, prolonged clinical/lab practice, and course requirements. Stage-specific stressors included fear of unemployment among third-year students, patient-related concerns among fourth-year students, and intensive graduation requirements among fifth-year students.

Conclusion: Psychological stress among dental students at Ahl-Albayt University varies by academic stage and stressor type, with females experiencing more patient-related and exam stress. These findings underscore the importance of targeted stress management interventions, early counseling, and supportive clinical training to mitigate the adverse effects of stress on academic performance and overall well-being.

Keywords: Psychological stress, Dental students, Gender differences, Academic stages.

Introduction

Dental school programs are known for their intense academic demands and pressure-filled learning atmosphere (Veal et al., 2004). Stress can have detrimental effects on both mental and physical health, leading to exhaustion, various illnesses, and impaired learning ability (Marin et al., 2011; Melamed et al., 2006). Recent research indicates that dental students experience high levels of stress due to the demanding curriculum, which requires them to master a wide range of theoretical, clinical, and interpersonal skills (Alvenfors et al., 2022; Jahan et al., 2022; Nair et al., 2023). Stressors impacting dental students can be categorized into five primary areas: personal factors, living conditions, the educational environment, academic demands, and

clinical pressures (Al-Sowygh, 2013; Alzahem et al., 2011; Polychronopoulou & Divaris, 2009). Dental students frequently report experiencing significant stress during their training (Basudan et al., 2017). In fact, they are more likely to suffer from stress, depression, obsessive-compulsive symptoms, and interpersonal sensitivity. Furthermore, research has shown that students in the later clinical years of their dental program tend to experience higher levels of stress than their earlier preclinical counterparts (Tricio et al., 2023). Previous studies demonstrated a strong link between depression and the third and fifth years of dental school (Al Faris et al., 2016; Bedewy & Gabriel, 2015). Another study revealed high levels of stress among later-stage factors related to clinical education (Jowkar et al., 2020). Previous studies reported the most stressful periods, which may be due to patient care responsibility (Divaris et al., 2008), time management challenges, fear of failure, exam-related anxiety, feelings of inadequacy, and the pressure of academic workload. These factors contributed to the development of symptoms consistent with depression, anxiety, and stress (Radeef & Faisal, 2018).

Academic performance may be influenced by factors such as a student's gender, ethnicity, stage of dental education, and living environment (Sanders & Lushington, 2002). Previous studies have shown that female and ethnic minority dental students experience higher levels of stress (Lloyd & Musser, 1989). As reported in a previous study, Female students reported higher stress levels than male students across all educational levels. Additionally, stress levels increased more significantly for women as their academic attainment rose compared to men (Beiter et al., 2015; Halboub et al., 2018). To investigate the level of perceived stress in the dental environment, the Dental Environment Stress (DES) scale is employed, a tool designed to measure the level of perceived stress in this environment. The DES scale is intended to assess stress specifically related to dental education and clinical work (Peker et al., 2009). It consists of various items that capture the stressors experienced by dental students and professionals in their academic and clinical settings (Harris et al., 2017).

Prolonged stress can have a negative impact on the well-being of dental students, leading to decreased performance, difficulties in patient interaction, and emotional detachment. These issues can ultimately hinder academic success and career prospects. To address these concerns, this study aimed to assess the stress levels and identify the sources of stress among preclinical and clinical dental students at Al-Bayt University.

Methods and Materials

The second half of the 2023–2024 academic year was dedicated to conducting this study. Participants in this academic and clinical training program were first- through fifth-year dental students from Ahl-Albayt School of Dentistry in Iraq. The research received ethical approval from the Medical Ethics Committee of Ahl-Albayt. Before being enrolled in the study, each student signed a written consent form to guarantee informed participation. Along with a thorough cover letter outlining the study's goals, stressing voluntary participation, and ensuring data confidentiality, the researchers provided a questionnaire. Three hundred fifteen students—representing 72.7% of the eligible population—responded to the study out of the 433 total students enrolled in the college, split between clinical and non-clinical stages. Using the Dental Environment Stress (DES) questionnaire, the sources of stress associated with undergraduate dental education and training were assessed.

The DES questionnaire is widely recognized as the most commonly used tool for assessing stress among dental students. This questionnaire comprised 19 items categorized into three domains that trigger stress. Since the bulk of students at the college are distributed among the preclinical stages of the first, second, and third stages of education, we designed three distinct sets of questionnaires. The first and second sets address shared concerns among all academic stages(pre-clinical and clinical stages), encompassing personal factors and environmental stress within the dental college. The third set, exclusively directed towards fourth and fifth-stage students, delves into common apprehensions related to clinical training experiences and patient interactions.

Additionally, the questionnaire includes information on the participants' gender and academic stage as well as their demographic distribution. Every response was evaluated using a 4-point Likert scale, where one denoted "no stress" and four denoted "extreme stress."

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Furthermore, the students' demographic information was acquired, encompassing their age, gender, academic year, and marital status. IBM SPSS Statistics for Windows, Version 20.0, was used to calculate the mode values for each group in the data analysis. After confirming data normality with the Kolmogorov–Smirnov test, the Mann-Whitney test was conducted to compare data between male and female participants. Additionally, an Independent-Samples Kruskal-Wallis Test and pairwise comparisons were used to assess differences between grades. P-values less than 0.05 were considered statistically significant.

Findings and Results

A total of 315 clinical dental students participated in the study, with 211 individuals (66.9%) identifying as female and 104 (33%) as male. A comprehensive overview of the socio-demographic attributes of the participants is delineated in Table 1.

Table 1

socio-demographic distributions among various stages.

Stage	Female	Male
First stage	70(69.3)	31(30%)
Second stage	68 (66%)	35(33.9%)
Third stage	25(62.5%)	15(37.5%)
Fourth stage	28(70%)	12 (30%)
Five stage	21 (65.6%)	11(34.3%)

The median scores of the three main domains of the DES questionnaire are presented in Table 2.

Table 2

Variations in median value among different stages.

Aspect	1st Stage	2nd Stage	3rd Stage	4th Stage	5th Stage
Home Atmosphere	2	2	1	1	2
Dentistry Field Choice	2	2	1	1	2
Colleague Interactions	2	2	2	2	2
Dream Achievement Expectations	3	3	2	2	3
Roommate Behavior Fears	3	3	2	2	2
Family Health Concerns	4	3	3.5	4	3
Unemployment Worries	3	3	4	3	3
Lack of Time for Relaxation	4	4	3.5	3	4
Deals with Teaching Staff	3	2	3	2	3.5
Prolonged Time to Practice in Lab/Clinic	2	4	3	4	4
Fear of Failing Final Exam	3	4	4	4	3
Fear from Ministry Instructions	3	3	3	4	4
Accumulation of Courses	4	4	3	4	4
Workload Examinations	4	4	4	3	4
Atmosphere Created by the Seniors of the Clinic	-	-	-	3.5	3
Complete Clinical Requirements Efficiently	-	-	-	4	4
Cheating of Patients	-	-	-	2	4
Fear of Dealing with Patients	-	-		2	3
Dealing with teaching staff in laboratories	2	3	3	-	-

Mann-Whitney U statistic revealed no statistical difference between the genders in most of the factors, as shown in Table 3

Table 3

DES Questionnaire relating to the personal factors of the Contributors

variables	Gender	N	Mean Rank	Sum of Ranks	Mann-Whitney U	P value
Home Atmosphere	Female	211	156.61	33045.50		
	Male	104	160.81	16724.50		
	Total	315			10679.500	.681
Choice of Dental fields.	Female	211	155.37	32784.00		
	Male	104	163.33	16986.00		
	Total	315			32784.000	.430
Difficulty in dealing with colleagues	female	211	163.08	34409.00		
	Male	104	147.70	15361.00		
	Total	315			9901.000	0.133
Dream achievement expectations	Female	211	155.37	32782.50		
	Male	104	163.34	16987.50		
	Total	315			10416.500	.443
Roommate behaviors roommate	Female	82	62.54	5128.50		
	Male	35	50.70	1774.50		
	Total	117			1144.500	.073
Family Health Concerns	Female	211	165.52	34760.00		
	Male	104	141.30	14695.00		
	Total	314			9235.000	*.014**
Unemployment Worries	Female	211	158.56	33455.50		
	Male	104	156.87	16314.50		
	Total	315			10854.500	.872
Lack of time for relaxation	female	211	159.89	33417.00		
	Male	104	149.62	15411.00		
	Total				10055.000	.272

Females showed high stress in workload examination compared to males in the dental environmental factor, as shown in Table 4

Table 4

Dental environmental factors.

	Gender	N	Mean Rank	Sum of Ranks	Mann-Whitney U	P value
Deals with teaching staff	Female	211	158.36	33414.00		
	male	104	157.27	16356.00		
	Total	315			10896.000	.916
Language barrier	female	211	158.29	33399.00		
	male	104	157.41	16371.00		
	Total	315			10911.000	.932
Examination load	female	211	167.20	34945.00		
	male	104	136.50	14196.00		
	Total	315			8736.000	*0.01**
Fear from the Ministry of Higher Education instructions	female	211	159.72	33700.50		
	male	104	154.51	16069.50		
	Total	315			10609.500	.611
Fear of passing the final exam	Female	211	161.47	34070.50		
	Male	103	149.36	15384.50		
	Total	314			10028.500	.230
Prolonged time in practice in laboratories and a dental clinic	female	211	158.11	33361.00		
	male	104	156.25	16094.00		
	Total	314			10738.000	.857
Fear of accumulation of courses	Female	211	156.36	32679.00		
	Male	104	158.29	16462.00		

Total	315		10734.000	. 838

When comparing stress induced by training between male and female students in the fourth and fifth stages, females exhibited high stress in patients' responses and cheating of patients about their history or adherence to instructions and appointments, as shown in Table 5.

Table 5

Training induces stress between genders.

	Gender	N	Mean Rank	Sum of Ranks	Mann-Whitney U	P value
The atmosphere created by the seniors of the dental clinic	Female	45	31.77	1398.00		
	male	22	36.95	813.00		
	Total	66			493.000	.507
Complete requirements in an efficient way	Female	45	32.38	1457.00		
	Male	22	37.32	821.00		
	Total	67			486.000	.309
Fear of patients cheating	female	45	35.12	1580.50		
	male	22	31.70	697.50		
	Total	67			300.000	*.001**
Fear of patient response	female	45	35.43	1594.50		
	Male	22	31.07	683.50		
	Total	67			384.500	*.024**

An independent-samples Kruskal-Wallis test revealed significant differences in most variables, as indicated by low p-values, as shown in Table 6.

Table 6

Samples Kruskal-Wallis test among grades.

Variable	Test Statistic	Degree of Freedom	Asymptotic Sig. (2-sided test)
Home Atmosphere			
Total N	315		
Test Statistic	17.259a	4	.002*
Choose the Dentistry field.			
Total N	315		
Test Statistic	19.163a	4	.001*
Difficulty in dealing with colleagues			
Total N	315		
Test Statistic	4.957a,b	4	.292
Dream achievement expectations			
Total N	315		
Test Statistic	34.651a	4	.000*
Lack of time for relaxation			
Total N	312		
Test Statistic	13.318a	4	.010*
Roommate behaviors			
Total N	117		
Test Statistic	9.518a	4	.049*
Family Health Concern			
Total N	314		
Test Statistic	13.864a	4	.008*
Unemployment worries			
Total N	315		
Test Statistic	11.789a	4	.019*

Several factors significantly impact students' experiences related to dental stress across different grades, as shown in Table 7.

Table 7

Dental environmental stress among grades.

Variable	Total N	Test Statistic	Degree Of Freedom	Asymptotic Sig. (2-sided test)
Dealing with teaching staff	315	31.851	4	.000*
Language barrier	315	12.725	4	.013*
Workload examination	313	3.274	4	.513
Atmosphere created by staff in the lab(1st-3rd stage)	242	4.296	2	.117
Ministry of Higher Education Instructions	315	7.063	4	.133
Fear of passing the final exam	314	15.378	4	.004*
Prolonged time of practice in the lab/ clinic	314	26.997	4	.000*
Accumulations of course	313	9.553	4	.049*

The results suggest in Table 8 that cheating and manipulation of patients and fear of dealing with the patient are significantly different between the clinical grades(fourth and fifth grades), with students in grade four reporting higher levels of these factors.

Table 8

Stress among grades by the Mann-Whitney U test between grades

Rank	Stage	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Asymp. Sig. (2-tailed)
The atmosphere created by teachers in the educational clinics	4	36	34.81	1253.00	493.000	.507
	5	30	31.93	958.00		
Completing the practical requirements with the required efficiency	4	36	36.00	1296.00	486.000	.309
	5	31	31.68	982.00		
Cheating and the manipulation of patients	4	36	26.83	966.00	300.000	.001*
	5	31	42.32	1312.00		
Fear of dealing with the patient	4	36	29.18	1050.50	384.500	.024*
	5	31	39.60	1227.50		

Results from multiple pairwise comparisons between different grade levels across various variables revealed significant differences in most variables among grades, as shown in Table 9.

Table 9

pairwise test among grades.

Home atmosphere					
	4-3	7.837	19.036	0.412	1.000
	4-5	-33.300	20.190	-1.649	0.991
	4-1	38.130	15.926	2.394	0.167
	4-2	56.018	15.860	3.532	0.004
	3-5	-25.462	20.190	-1.261	1.000
	3-1	30.293	15.926	1.902	0.572
	3-2	48.181	15.860	3.038	0.024
	5-1	4.830	17.290	0.279	1.000
	5-2	22.718	17.229	1.319	1.000
	1-2	-17.888	11.951	-1.497	1.000
Choice of the dentistry field.					
	4-3	7.837	19.036	0.412	1.000
	4-5	-33.300	20.190	-1.649	0.991
	4-1	38.130	15.926	2.394	0.167
	4-2	56.018	15.860	3.532	0.004
	3-5	-25.462	20.190	-1.261	1.000

	3-1	30.293	15.926	1.902	0.572
	3-2	48.181	15.860	3.038	0.024
	5-1	4.830	17.290	0.279	1.000
	5-2	22.718	17.229	1.319	1.000
	1-2	-17.888	11.951	-1.497	1.000
Dream achievement expectations					
	4-3	8.450	19.403	0.435	1.000
	4-5	-16.953	20.580	-0.824	1.000
	4-1	35.855	16.234	2.209	0.272
	4-2	76.677	16.166	4.743	0.000
	3-5	-8.503	20.580	-0.413	1.000
	3-1	27.405	16.234	1.688	0.914
	3-2	68.227	16.166	4.220	0.000
	5-1	18.902	17.624	1.073	1.000
	5-2	59.724	17.561	3.401	0.007
	1-2	-40.822	12.182	-3.351	0.008
Lack of time for relaxation					
	4-3	10.113	17.486	0.578	1.000
	4-1	18.610	14.669	1.269	1.000
	4-5	-37.581	18.697	-2.010	0.444
	4-2	44.368	14.629	3.033	0.024
	3-1	8.498	14.537	0.585	1.000
	3-5	-27.468	18.593	-1.477	1.000
	3-2	34.255	14.496	2.363	0.181
	1-5	-18.971	15.973	-1.188	1.000
	1-2	-25.758	10.935	-2.356	0.185
	5-2	6.787	15.936	0.426	1.000
Roommate behavior					
	5-4	1.053	10.662	0.099	1.000
	5-3	7.762	12.230	0.635	1.000
	5-1	19.619	9.688	2.025	0.429
	5-2	22.251	10.486	2.122	0.338
	4-3	6.709	11.365	0.590	1.000
	4-1	18.566	8.571	2.166	0.303
	4-2	21.198	9.463	2.240	0.251
	3-1	11.857	10.456	1.134	1.000
	3-2	14.489	11.199	1.294	1.000
	1-2	-2.632	8.350	-0.315	1.000
Unemployment worries					
	5-4	0.434	20.652	0.021	1.000
	5-1	5.639	17.686	0.319	1.000
	5-2	9.920	17.623	0.563	1.000
	5-3	55.284	20.652	2.677	0.074
	4-1	5.205	16.291	0.320	1.000
	4-2	9.486	16.223	0.585	1.000
	4-3	54.850	19.471	2.817	0.048
	1-2	-4.281	12.225	-0.350	1.000
	1-3	-49.645	16.291	-3.047	0.023
	2-3	-45.364	16.223	-2.796	0.05
Fear of health concerns					
	2-5	-11.195	16.582	-.675	1.000
	2-3	-14.182	15.265	-.929	1.000
	2-4	-15.655	15.405	-1.016	1.000
	2-1	41.967	11.503	3.648	.003
	5-3	2.988	19.433	.154	1.000
	5-4	4.460	19.543	.228	1.000
	5-1	30.773	16.641	1.849	.644
	3-4	-1.472	18.438	-.080	1.000
	3-1	27.785	15.329	1.813	.699

The results of the pairwise comparisons in Table 10 between different factors influencing the student academic stress environment reveal some interesting details.

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Table 10

Comparison among grades.

Variable	Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig. a
Dealing with teaching staff						
2-4	-17.618	-1.092	16.127	-1.092	.275	1.000
2-3	-25.243	-1.565	16.127	-1.565	.118	1.000
2-1	60.373	4.968	12.152	4.968	.000	.000*
2-5	-68.505	-3.910	17.519	-3.910	.000	.001*
Language barrier						
3-5	-12.634	-.618	20.444	-.618	.537	1.000
3-4	-32.300	-1.676	19.275	-1.676	.094	.938
3-2	41.243	2.568	16.059	2.568	.010	.102
3-1	50.885	3.155	16.126	3.155	.002	.016*
5-4	19.666	.962	20.444	.962	.336	1.000
Passing of the final exam						
1-5	-26.940	-1.562	17.243	-1.562	.118	1.000
1-3	-33.122	-2.111	15.692	-2.111	.035	.348
1-4	-37.647	-2.399	15.692	-2.399	.016	.164
1-2	-43.930	-3.731	11.775	-3.731	.000	.002*
5-3	6.183	.308	20.071	.308	.758	1.000
Prolonged time of practice in the lab/clinic						
1-3	-27.489	-1.709	16.089	-1.709	.088	.875
1-2	-40.850	-3.380	12.087	-3.380	.001	.007*
1-4	-43.151	-2.682	16.089	-2.682	.007	.073
1-5	-83.311	-4.771	17.463	-4.771	.000	.000*
3-2	13.361	.835	15.999	.835	.404	1.000
Accumulation of courses						
3-4	-20.345	-1.146	17.746	-1.146	.252	1.000
3-1	30.163	2.044	14.753	2.044	.041	.409
3-2	40.151	2.729	14.712	2.729	.006	.064
3-5	-47.016	-2.514	18.703	-2.514	.012	.119
4-1	9.818	.659	14.888	.659	.510	1.000
4-2	19.806	1.334	14.847	1.334	.182	1.000
4-5	-26.671	-1.418	18.810	-1.418	.156	1.000
1-2	-9.988	-.900	11.098	-.900	.368	1.000
1-5	-16.853	-1.052	16.017	-1.052	.293	1.000
2-5	-6.865	-.430	15.979	-.430	.667	1.000

Discussion and Conclusion

Undergraduate dental education is both academically and clinically demanding, creating a challenging learning environment. Students must grasp both the theoretical and technical aspects of the curriculum, in addition to managing patient interactions, to become qualified dental professionals (Subramanian & Thomson, 2017). Many researchers have examined the stress levels of undergraduate dental students using a range of techniques, including self-reported surveys such as the Dental Environment Stress (DES) questionnaire and the Perceived Stress Scale (Elani et al., 2014; Polychronopoulou & Divaris, 2009, 2010).

The dental program in Iraq spans five years and is consistent with the academic structure of other dental programs worldwide. However, it includes a distinctive element that adds extra stress compared to dental education in different countries. The uniqueness arises from a national policy by the Ministry of Higher Education that standardizes the curriculum across all colleges and establishes guidelines for success. However, the implementation of this policy often involves unpredictable and spontaneous instructions, centralized control of final examinations, and determination of success thresholds, all of which are perceived as additional stressors by both faculty and students.

In the present study, we examined the stressors and their perceived levels among students in the School of Dentistry at Ahl-Albayt University, College of Dentistry. We modified the DES score to align with the local dental environment and chose specific questions that trigger stress among dental students in Iraq without elaboration. The results showed a significant difference between genders in family health concerns, suggesting more worry, which aligns with previous studies showing

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that women often take on the role of caregivers (Jain et al., 2016).

Male dental students in Iraq face significant stress due to concerns about choosing dentistry, future career goals, and unemployment fears. Many students are pushed into the field by their parents, leading to a lack of interest and uncertainty about their future in the field of dentistry. This finding, in line with previous studies, shows that students who chose dentistry as their preferred field experienced less stress compared to those who were pushed into the field by their parents (Acharya, 2003; Tangade et al., 2011). A major issue for the future of dentistry in Iraq is the anticipated high unemployment rate among graduates, which is a concern even for students in the early stages of their dental education. Iraqi men, who traditionally bear the responsibility of being the primary breadwinners for their families, including their parents, wives, and children, feel this pressure particularly strongly.

Female students exhibited higher stress levels during examination periods. This difference could be linked to biological, psychological, and hormonal factors, particularly the higher cortisol levels in females. This finding, supported by previous studies, shows an elevation of cortisol levels at the beginning of the academic year (Fluerașu et al., 2021; Nijakowski et al., 2022). However, this remains a possibility. Our students need a serious study to investigate the biological and hormonal causes that affect them during examination periods.

Women might express more fear about patients cheating and patient responses compared to men. One possible factor is societal norms and expectations around gender roles, which might make women feel more pressure or vulnerability during patient interactions. Additionally, past experiences or cultural influences in Iraq could shape perceptions and anxieties differently for women and men in this setting. The female dental student requires a more supportive approach to overcome her fear of patient communication and dealing with patients. She also needs guidance on selecting the most suitable patients for practicing her skills.

The third stage of dental students require additional attention and support when show significant differences about the fear of unemployment this is supported previous study, third-year students are in a transitional phase from preclinical to clinical studies, This finding aligns with previous studies that highlighted the challenges third-year students face, particularly due to insufficient guidance on how to properly prepare a cavity, contributing to increased stress (Mocny-Pachońska et al., 2020).

The results indicated a significant difference between fifth-year and second-year students in their interactions with teaching staff. At this stage, both students and faculty staff have higher expectations, and students are often managing more challenging clinical cases, advanced coursework, and the pressure to showcase their skills, all of which can increase stress levels. This finding is supported by a previous study (Boorberg, 2012).

The results revealed significant differences between students in the first and second years in their interactions with the teaching staff. Students in their first year experienced more difficulty, likely due to the need for more time to adapt to the dental environment. Regarding language barriers, first-year students showed translation difficulties compared to other students, who struggled with understanding lectures, which affected their participation in the dental environment. Both first- and second-year students experienced high stress about passing their final exams, which is consistent with a previous study (Alzahem et al., 2011).

Despite the absence of statistically significant variations among the stages, each demonstrates a high degree of fear and tension associated with the Ministry of Education's instructions. Therefore, most academics agree on the necessity of having a clear, explicit, consistent, and well-known policy so that students can overcome their fears.

The results demonstrated significant differences between first- and fifth-year students in response to extended clinical and laboratory practice, with fifth-year students experiencing greater stress due to their responsibilities and the extensive requirements for graduation. This finding aligns with Boorberg (2012). Additionally, there were noticeable variations in stress levels among fourth- and fifth-year students, particularly in relation to clinical factors, with fourth-year students experiencing higher stress levels. Perhaps this is because it is their first year interacting with patients, marking a crucial stage where students must apply all the scientific knowledge they have accumulated over the previous years to treat patients based on scientific principles.

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Additionally, they feel pressure from the direct supervision of specialists. Studies have indicated that dental students report feeling more stressed as they progress through the clinical years of their education, with significant differences noted in workload and patient interaction (Abu-Ghazaleh et al., 2016; Manolova et al., 2012).

The dental career is regarded as one of the most stressful fields among medical fields due to its clinical and educational demands, and female students exhibit higher stress related to patient interactions. Stress levels varied across academic stages, with moderate stress in early stages, increasing in middle stages, and remaining high in the final stage due to clinical demands and workload. This suggests that stress intensifies and shifts in focus as students progress through their dental education.

The main weaknesses and limitations of this research paper are the disparities in the number of students across different academic stages. The first and second-year students constitute the majority of the sample, while the fourth and fifth-year students are fewer in number, which affects the sample size and consequently the nature of the results.

The nature of the results obtained from the research was not entirely interpretable due to the sample size. Additionally, the subject requires further studies to understand the valid reasons behind the results.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Declaration of Helsinki, which provides guidelines for ethical research involving human participants. Ethical considerations in this study included the fact that participation was entirely optional.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

Zainab A. Al-Mashhadi developed the research concept and organized the majority of the questions posed to the students. She also gathered the data and authored both the introduction and the materials and methods sections. Amjed F. Hussein, together with Ayser K. Thamir, handled the statistical analysis and were responsible for writing the results and discussion sections. All contributors participated in reviewing and finalizing the paper before submission and unanimously approved its content. The researchers affirm that this manuscript has been submitted solely to this journal and has not been submitted elsewhere.

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