ORIGINAL ARTICLE

Perceived Stress and its Influence among Undergraduate Dental Students in Lahore: A Cross-Sectional Study

Muhammad Jamal Hussain[1]	**BDS, MPhil**
Zain Gulzar[2]	**BDS, MHPE**
Waqas Mirza[3]	**BDS, MSc**
Ayma Syed[4]	**BDS, MPhil**
Baseer Ahmed Khan[5]	**BDS, MSPH**
Muhammad Sumair Farooq[6]	**BDS, MPhil**
Shamaila Manzoor[7]	**MBBS, FCPS, MHPE**
Muhammad Ainul Haq[8]	**BDS, MHPE**

OBJECTIVES: The main aim of this study was to quantify the perceived stress among dental undergraduate students and identify the factors that influence their performance and health.

METHODOLOGY: The study involved 316 BDS students from 6 dental colleges in Lahore. The study, data entry, and analysis were completed in a year. Stress was quantified using a modified Dental Environment Stress (DES) questionnaire consisting of 38 questions for dental students.

RESULTS: The main sources of stress in the present study were five factors: assigned workload, self-efficiency belief, faculty and administration matters, and patient treatment, followed by pressure of clinical performance. The findings were similar to different dental education systems across the world. The results of this study support the evidence in the previous literature, indicating that dental students are exposed to various work-related and academic stressors that may negatively affect their health.

CONCLUSION: Students have to learn a lot and develop professional expertise rapidly. Students must understand the profession's nature and the study environment before applying. Conducting entrance interviews to assess the candidates' interest and suitability is a good idea. Establishing student advisors, counselors, and a faculty advising system can provide valuable support.

KEYWORDS: Stress, mental stress, perceived stress, undergraduate dental students

HOW TO CITE: Hussain MJ, Gulzar Z, Mirza W, Syed A, Khan BA, Farooq MS, Manzoor S, Haq MA. Perceived stress and its influence among undergraduate dental students in Lahore: a cross-sectional study. J Pak Dent Assoc 2024;33(2):43-47.

DOI: https://doi.org/10.25301/JPDA.332.43

Received: *22 December 2023*, ***Accepted:*** *30 June 2024*

INTRODUCTION

The transition from a twelve-grader student life to the demanding environment of a professional dental college can be overwhelming for many dental students. The mental, physical, and emotional stress they encounter during this transition can significantly impact their well-being. This trend among dental students has been reported for half a century in various curricula.[1,2]

Educational institutions must recognize these challenges and provide adequate support to help students navigate this critical training phase.

Concerns about dental students' stress have escalated among educators. While mounting pressure can lead to decreased student performance[3], elevated stress levels may cause a range of physical and psychological issues.[4] Identifying the sources of stress among dental students is crucial to mitigating adverse effects on their well-being. These students are exposed to different stresses that depend on external or internal factors.[5-8] It is not just the undergraduate study period that brings stress but may last during the

1. Assistant Professor, Department of Community Dentistry, Niazi Medical and Dental College Sargodha, Pakistan.
2. Assistant Professor, Department of Medical Education, Watim Dental College, University of Health Sciences, Lahore, Pakistan.
3. Demonstrator, Department of Oral Medicine, Sharif Medical and Dental College, Lahore, Pakistan.
4. Professor, Department of Community and Preventive Dentistry, Azra Naheed Dental College, Superior University, Lahore, Pakistan.
5. Lecturer, Department of Community and Preventive Dentistry, Watim Dental College, Rawalpindi, Pakistan.
6. Professor, Department of Oral Biology, Shahida Islam Medical and Dental College, Lodhran.
7. Assistant Professor, Department of Medical Education, AJKMC, University of Health Sciences, Lahore, Pakistan.
8. Lecturer, Department of Medical Education, Centre of Medical Education, Postgraduate Medical Education, Nine Wells Hospital, Dundee.

Corresponding author: "Dr. Zain Gulzar" < drzaingulzar@gmail.com >

practicum, postgraduate study period, and later into their everyday life.[5,9,10]

Perceived stress among undergraduate dental students is a significant concern. These students face various challenges, including theoretical knowledge acquisition, clinical competencies, and interpersonal skills development. Stress can manifest as fatigue, tension, sleeplessness, anxiety, and other symptoms, potentially leading to depression, substance abuse, and burnout. A negative association has been observed between stress and academic performance.[11]

Dental undergraduate students face unique stressors within their academic environment. The demanding nature of dentistry, coupled with the need for a thorough knowledge of biological sciences and constant skill upgradation, contributes to their vulnerability to stress. Understanding and addressing these stressors are crucial for supporting students throughout their dental education journey.

The current study was designed to identify the perceived stress among dental undergraduate students and to determine various factors disturbing their performance and health.

METHODOLOGY

This quantitative, cross-sectional study in 6 dental colleges in Lahore (Five private and one public sector) affiliated with the University of Health Sciences (UHS), Lahore. This was done to ensure uniformity of the curriculum taught and the examination system included.

A sample size of 316 BDS students was determined by using the WHO calculator. The World Health Organization (WHO) provides a sample size calculator for various purposes. For this study value of 95% for Confidence Level, 5% for Margin of Error, 50% for Population Proportion, and a Population Size of 1750 were used as the key parameters in this calculator (Noncommunicable Disease Surveillance, Monitoring and Reporting (who.int).

Stress was calculated using a pre-validated, modified Dental Environment Stress (DES) questionnaire which consisted of 38 questions was used as the study tool.[12] Five major causative factors, namely, self-efficacy belief, workload, patient behavior, performance pressure, and the influence of faculty and administration on the students were measured to identify the levels of stress in undergraduate students.

The parent institution granted the certificate of ethical approval (IRB No. 1174. Written permission was taken from the study institutions and verbal consent was sought from the participants before collecting the data.

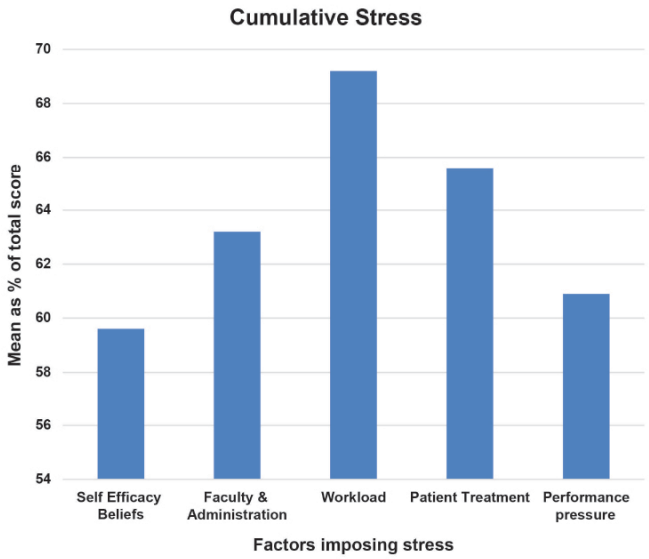
DATA ANALYSIS

The data was analyzed using SPSS version 22. The level of stress was assessed using frequencies and percentages. Age was presented as mean ± standard deviation. The comparison between stress level and age, year of study, and gender was made using a chi-square test with a correlation P-value<0.05 was considered significant at a confidence level of 95% for all the analyses.

RESULTS

Among 316 participants, 85 were males (26.9%) and 231 were females (73.1%) aged between 20 and 24 years. It can be observed in Figure 1, that the majority (63.7%) of the dental students questioned were stressed in their academic/ professional environment. With 69.2% identifying workload \as the main source of stress, closely followed by patient treatment (65.6%), faculty and administration (63.2%), performance pressure (60.9%), and self-efficacy belief (59.6%).

Figure 1: Factors imposing stress and their mean percentage



Work efficiency was further analyzed by connecting multiple stress-inducing factors like exam performance efficacy and employment chances in the future, work stress and routine working pressures, etc. According to the outcomes, exams and grades cause additional stress for 37.7 percent of pupils. A multifarious atmosphere troubled 31.3%, while fear of joblessness put 30.7% of the pupils under extreme stress. Among some noteworthy stressors for all the pupils was a lack of relaxation time. Extra stress was induced in 41.5% and 40.0% of the students due to more working days and excess working times respectively. Deficiency of time to accomplish the assigned tasks was a cause that exerted extreme pressure on the least number of students,

i.e. 24.4%. This aspect was also exerting reasonable stress on 26.9% of the pupils. A major cause of severe stress for a maximum of 33.9% of the students was the pressure from the supervisors. The fear of failing was the aspect that exhibited extreme stress in 45.6% of students. Deficiency of self-assurance to be a successful student exerted the uppermost moderate stress within 30.1% of pupils.

Table 1: Descriptive statistics and statistical test scores

	Male		Female		Total		t-test or Mean Whitney U test	
	Mean	SD	Mean	SD	Mean	SD	t/z	p-value
Self-efficacy Beliefs	19.78	5.67	22.10	4.81	21.47	5.15	-3.62	<0.001
Faculty and administration	25.16	5.94	25.30	6.26	25.26	6.17	-0.17	0.864
Workload	12.68	3.52	14.27	3.60	13.84	3.64	-3.24*	0.001
Patient treatment	14.20	4.30	16.31	3.83	15.74	4.06	-3.74*	<0.001
Performance pressure	18.84	4.72	19.74	4.88	19.50	4.84	-1.22*	0.223

As per the statistical breakdown in Table 1, the average stress scores were significantly higher in females than males for self-efficacy belief (22.10), workload (13.84), and patient treatment (15.74) with p-values <0.001, 0.001 and 0.001, respectively. To work on patients of opposite gender was one of the factors that concerned most of the pupils. A noteworthy association with a p-value of 0.001 was noted between patient treatments and gender; females had higher stress scores (42.15%). Workload had a significantly higher stress score among the students of third year. Patient care had a higher stress score among fourth-year students, with p-values of 0.003 and 0.015, respectively. It was detected that stress connected to medical items was usually higher for fourth-year students than for third-year students. Age also matters in stress management. The students were divided into two groups: 20 - 22 years and >22 years of age. The findings showed less than 22-year-old students felt more stress during clinical practice than students older than 22. The significance relationship of p=0.008 was observed.

DISCUSSION

This study was intended to quantify the perceived stress among undergraduate dental students and determine various factors affecting their performance and health. The results of this study support the existing evidence in the previous literature[13-16], indicating that dental students are subject to various work-related and academic stressors that may negatively affect their health. It is similar to the findings of other studies.[2,17-20] These high stress levels can be connected to the fact that the start of clinical training puts an immense load on students, as a result of which they do not have time for other activities.[21,22]

Like these findings, many scientists also identified self-efficacy beliefs in students with high stress levels regarding examinations.[23,24] As per the results of this study, academic pressure, working hours, and ongoing clinical events are usually more stressful than personal problems.[25,26] In addition, long hours and more workload lead to a stressful educational environment[27,28], which results in fear of failure due to concerns about falling behind in course requirements.[29,30] One of the top stressors during professional education is the fear of not getting a job Guo et al.[31] In a study, many students reported that working on patients with a dirty mouth was another stressor.[29,32]

Sanders and Lushington found that students who had low grades in examinations related to clinical performance and basic understanding reported higher levels of stress concerning their relationships with the faculty members of their institutes.[26] For the relationship between gender and perceived sources of stress, females reported higher stress than males, which is consistent with the findings of others[2,20] This is supported by very few previous studies[2,20]; other findings did not sustain any gender difference[33] or showed that males experienced tremendous stress.[34,35]

Workload and patient treatment were identified as the main stress-inducing factors when a comparison was made between the scores of third and fourth-year students.[2,36-38] The completion of their quotas to be eligible to appear in the final exams was a major cause of increase in stress levels in these students. They may be uncertain about some aspects of their clinical proficiency.[4,39] The recent work of Jowkar Z et al.; 2020[5] and Burkhard G. et al.; 2021[40] also similar to the findings of the current study; a rise in stress levels among fourth-year students points to the stress the students face while learning clinical skills and handling the demands of the academic course load, especially those related to medical subjects.[35,41] The students need to fulfill certain clinical requirements before being allowed to appear in the exams. To produce graduates that are highly competent in clinical skills dental colleges largely emphasized their training in the clinical subjects.[25,42] This study was conducted to build a helpful, stress-free environment for the dental undergraduate students in the dental colleges of Lahore. The findings are found to be similar to the ventures conducted in other countries with different curricula and education systems. It is difficult to eliminate all the stressors in a dental education program. To become a responsible dental professional, students must reach high levels of knowledge and professional skills and develop good attitudes toward patient care, all within a short time.

Similar studies should be carried out in Pakistan to get a wider view of the stress levels of dental students.

CONCLUSION

Among the five critical stress factors, self-efficacy, workload, patient behavior, performance pressure, and faculty/administration influence for dental students, the workload was the primary stressor (69.2%). Rapidly achieving knowledge, skills, and positive attitudes is crucial for aspiring dental professionals. Conducting similar studies in all Pakistani dental colleges is essential to understand student stress comprehensively.

RECOMMENDATIONS

It is recommended that before pursuing dentistry in Pakistan, students should experience the profession's nature and environment. Entrance interviews and support programs are essential. Conducting broader stress studies in all dental colleges is recommended.

CONFLICT OF INTEREST

There is no conflict of interest.

SOURCE OF FUNDING

This study was self-financed by the authors.

REFERENCES

1. Atkinson JM, Millar K, Kay EJ, Blinkhorn AS. Stress in dental practice. - Abstract - Europe PMC. Dental Update. 1991;60-64.

2. Polychronopoulou A, Divaris K. Perceived Sources of Stress Among Greek Dental Students. J Dent Educ. 2005;69:687-92. *https://doi.org/10.1002/j.0022-0337.2005.69.6.tb03952.x*

3. Pascoe MC, Hetrick SE, Parker AG. The impact of stress on students in secondary school and higher education. http://mc.manuscriptcentral.com/rady. 2019;25:104-12. *https://doi.org/10.1080/02673843.2019.1596823*

4. Chaabane S, Chaabna K, Bhagat S, Abraham A, Doraiswamy S, Mamtani R, et al. Perceived stress, stressors, and coping strategies among nursing students in the Middle East and North Africa: an overview of systematic reviews. Syst Rev. 2021;10(1). *https://doi.org/10.1186/s13643-021-01691-9*

5. Jowkar Z, Masoumi M, Mahmoodian H. Psychological Stress and Stressors Among Clinical Dental Students at Shiraz School of Dentistry, Iran. Adv Med Educ Pract. 2020;11:113-20. *https://doi.org/10.2147/AMEP.S236758*

6. Inquimbert C, Tramini P, Alsina I, Valcarcel J, Giraudeau N. Perceived Stress among French Dental Students and Their Opinion about Education Curriculum and Pedagogy. J Int Soc Prev Community Dent. 2017;7(Suppl 2):S92-8. *https://doi.org/10.4103/jispcd.JISPCD_257_17*

7. Juneja R, Sikka N, Kumar V, Chahal S, Arora M, Middha M, et al. Factors causing stress in postgraduate dental students during COVID-19 pandemic: A cross-sectional survey. Dent Res J (Isfahan). 2021;1:92. *https://doi.org/10.4103/1735-3327.330873*

8. Li N, Peng J, Yang R. How do working conditions affect the turnover intention of medical social workers in China? BMC Health Serv Res. 2022;22(1). *https://doi.org/10.1186/s12913-021-07435-8*

9. Ersan N, Fisekçioglu E, Dölekoglu S, Oktay I, Ilgüy D. Perceived sources and levels of stress, general self-efficacy and coping strategies in clinical dental students. Psychol Health Med. 2017;22:1175-85. *https://doi.org/10.1080/13548506.2017.1286359*

10. Ersan N, Dölekoglu S, Fisekçioglu E, Ilgüy M, Oktay I. Perceived sources and levels of stress, general self-efficacy and coping strategies in preclinical dental students. Psychol Health Med. 201;23:567-77. *https://doi.org/10.1080/13548506.2017.1384844*

11. Amith H, D'Cruz A, Sony B, Soumya R, Srivastav T, Thomas S. Perceived sources and coping mechanisms of stress among undergraduate Indian dental students. SRM J Res Dent Sci. 2012;3:180. *https://doi.org/10.4103/0976-433X.107398*

12. Shavandi, Hasan; Veshki SK. Effectiveness of compassion-focused therapy on self-criticism of the women applying for divorce. J Educ Health Promot. 2021;10-5. *https://doi.org/10.4103/jehp.jehp_495_20*

13. Lin XJ, Zhang CY, Yang S, Hsu ML, Cheng H, Chen J, et al. Stress and its association with academic performance among dental undergraduate students in Fujian, China: A cross-sectional online questionnaire survey. BMC Med Educ. 2020;20:1-9. *https://doi.org/10.1186/s12909-020-02095-4*

14. Ragab EA, Dafallah MA, Salih MH, Osman WN, Osman M, Miskeen E, et al. Stress and its correlates among medical students in six medical colleges: an attempt to understand the current situation. Middle East Curr Psychiatry. 2021;28:1-10. *https://doi.org/10.1186/s43045-021-00158-w*

15. Basudan S, Binanzan N, Alhassan A. Depression, anxiety and stress in dental students. Int J Med Educ. 2017;8:179. *https://doi.org/10.5116/ijme.5910.b961*

16. Ahad A, Chahar P, Haque E, Bey A, Jain M, Raja W. Factors affecting the prevalence of stress, anxiety, and depression in undergraduate Indian dental students. J Educ Health Promot. 2021;10(1). *https://doi.org/10.4103/jehp.jehp_1475_20*

17. Weidner G, Kohlmann CW, Dotzauer E, Burns LR. The effects of academic stress on health behaviors in young adults. 2007;9:123-33. *https://doi.org/10.1080/10615809608249396*

18. Ray M, Milston A, Doherty P, Crean S. In their own words: investigating the preparedness of final year dental students in the UK

for independent general dental practice. Br Dent J. 2018;225:340-9. *https://doi.org/10.1038/sj.bdj.2018.646*

19. Garbee WH, Zucker SB, Selby GR. Perceived sources of stress among dental students. J Am Dent Assoc. 1980;100:853-7. *https://doi.org/10.14219/jada.archive.1980.0279*

20. Abu-Ghazaleh SB, Sonbol HN, Rajab LD. A longitudinal study of psychological stress among undergraduate dental students at the University of Jordan. BMC Med Educ. 2016;16:1-6. *https://doi.org/10.1186/s12909-016-0612-6*

21. Khanagar SB, Al-Ehaideb A, Jamleh A, Ababneh K, Maganur PC, Vishwanathaiah S, et al. Psychological Distress among Undergraduate Dental Students in Saudi Arabia and Its Coping Strategies-A Systematic Review. Healthc (Basel, Switzerland). 202;9(4). *https://doi.org/10.3390/healthcare9040429*

22. Dodge W, Dale R, Hendricson W. A preliminary study of the effect of eliminating requirements on clinical performance. J Dent Educ. 1993;57:667-72. *https://doi.org/10.1002/j.0022-0337.1993.57.9.tb02788.x*

23. Sofola OO, Jeboda SO. Perceived sources of stress in Nigerian dental students. Eur J Dent Educ. 2006;10:20-3. *https://doi.org/10.1111/j.1600-0579.2006.00391.x*

24. Westerman G, Grandy T, Ocanto R, Erskine C. Perceived sources of stress in the dental school environment. J Dent Educ. 1993;57:225-31. *https://doi.org/10.1002/j.0022-0337.1993.57.3.tb02732.x*

25. Elgezawi M, Hassan K, Alagl A, Al-Thobity AM, Al-Mutairi B, Al-Houtan T, et al. Complexity of comprehensive care treatments in undergraduate dental programs: The benefits of observing and assisting experienced faculty members. Saudi Dent J. 2017;29:161. *https://doi.org/10.1016/j.sdentj.2017.07.005*

26. Al-Omari WM. Perceived sources of stress within a dental educational environment. J Contemp Dent Pract. 2005;6:64-74. *https://doi.org/10.5005/jcdp-6-4-64*

27. Firth J. Levels and Sources of Stress in Medical Students. Br Med J (Clin Res Ed). 1986;292(6529):1177-80. *https://doi.org/10.1136/bmj.292.6529.1177*

28. Henning K, Ey S, Shaw D. Perfectionism, the impostor phenomenon and psychological adjustment in medical, dental, nursing and pharmacy students. Med Educ. 1998;32:456-64. *https://doi.org/10.1046/j.1365-2923.1998.00234.x*

29. Ahad A, Chahar P, Haque E, Bey A, Jain M, Raja. Factors affecting the prevalence of stress, anxiety, and depression in undergraduate Indian dental students. J Educ Health Promot. 2021;1-6.

30. Guo Y, Hu S, Liang F. The prevalence and stressors of job burnout among medical staff in Liaoning, China: a cross-section study. BMC Public Health. 2021;21:1-11. *https://doi.org/10.1186/s12889-021-10535-z*

31. Guo Y, Hu S, Liang F. The prevalence and stressors of job burnout among medical staff in Liaoning, China: a cross-section study. BMC Public Health. 2021;21(1). *https://doi.org/10.1186/s12889-021-10535-z*

32. Mackay C, Cox T, Burrows G, Lazzerini T. An inventory for the measurement of self-reported stress and arousal. Br J Soc Clin Psychol. 1978;17:283-4. *https://doi.org/10.1111/j.2044-8260.1978.tb00280.x*

33. I F Bradley, D C Clark, J E Eisner, K De Gruchy, D L Singer, K Hinkleman, et al. The student survey of problems in the academic environment in Canadian dental faculties - PubMed. J Dent Educ. 1989;126-31. *https://doi.org/10.1002/j.0022-0337.1989.53.2.tb02291.x*

34. Kumar S, Dagli RJ, Mathur A, Jain M, Prabu D, Kulkarni S. Perceived sources of stress amongst Indian dental students. Eur J Dent Educ. 2009;13:39-45. *https://doi.org/10.1111/j.1600-0579.2008.00535.x*

35. Acharya S. Factors Affecting Stress Among Indian Dental Students. J Dent Educ. 2003;67:1140-8. *https://doi.org/10.1002/j.0022-0337.2003.67.10.tb03707.x*

36. Veeraboina N, Doshi D, Kulkarni S, Reddy MP, Danatala SN, Srilatha A. Perceived stress and coping strategies among undergraduate dental students - an institutional based study. Int J Adolesc Med Health. 2020; *https://doi.org/10.1515/ijamh-2019-0070*

37. F J Burke 1, J R Main RF. The practice of dentistry: an assessment of reasons for premature retirement. Br Dent J. 1998;184:394-6.

38. Humphris G, Blinkhorn A, Freeman R, Gorter R, Hoad-Reddick G, Murtomaa H, et al. Psychological stress in undergraduate dental students: Baseline results from seven European dental schools. Eur J Dent Educ. 2002;6:22-9. *https://doi.org/10.1034/j.1600-0579.2002.060105.x*

39. Sikka N, Juneja R, Kumar V, Bala S. Effect of Dental Environment Stressors and Coping Mechanisms on Perceived Stress in Postgraduate Dental Students. Int J Clin Pediatr Dent. 2021;14:681. *https://doi.org/10.5005/jp-journals-10005-2005*

40. Gusy B, Lesener T, Wolter C. Time Pressure and Health-Related Loss of Productivity in University Students: The Mediating Role of Exhaustion. Front public Heal. 2021;9. *https://doi.org/10.3389/fpubh.2021.653440*

41. Dahlin M, Joneborg N, Runeson B. Stress and depression among medical students: A cross-sectional study. Med Educ. 2005;39:594-604. *https://doi.org/10.1111/j.1365-2929.2005.02176.x*

42. Silva V, Costa P, Pereira I, Faria R, Salgueira AP, Costa MJ, et al. Depression in medical students: Insights from a longitudinal study. BMC Med Educ. 2017;17:1-9. *https://doi.org/10.1186/s12909-017-1006-0*