

# The Impact of Peer Support on Stress and Anxiety Levels of Dental Students: Cross-Sectional Research

## Akran Desteğinin Diş Hekimliği Öğrencilerinin Stres ve Kaygı Düzeylerine Etkisi: Kesitsel Araştırma

<sup>1</sup> Samet TOSUN<sup>a</sup>, <sup>2</sup> Havva Kübra ARSLAN<sup>a</sup>, <sup>3</sup> İhsan Furkan ERTUĞRUL<sup>a</sup>

<sup>a</sup>Pamukkale University Faculty of Dentistry, Department of Endodontics, Denizli, Türkiye

**ABSTRACT Objective:** Stress and anxiety levels during dental education can have a negative impact on students' performance and motivation. Therefore, peer support is believed to enhance students' psychological well-being during the education process, which may increase their participation and success in dental education. The study aimed to determine whether peer support could reduce the levels of stress and anxiety experienced by dental students during practical training at the endodontic clinic. **Material and Methods:** The study included 4th-year dental students who received practical training at the endodontics clinic. The participants were divided into two groups: those who received peer support (study group) (n=24) and those who did not (control group) (n=24). The "Clinical Stress Questionnaire" (CSQ) and "State-Trait Anxiety Inventory" (STAI-S, STAI-T) were administered to both groups at the pre-test and post-test. The data were analyzed using SPSS 22. **Results:** The comparison between the post-test and pre-test inventories revealed that peer support resulted in a significant reduction in state anxiety scores (STAI-S) within the study group (p<0.05). However, there was no significant difference in trait anxiety scores (STAI-T) between the study group. Additionally, the study group exhibited a statistically significant decrease in the total mean score for the CSQ on the post-test compared to the pre-test (p<0.05). **Conclusions:** Peer support can reduce students' STAI-S and CSQ scores during education. However, peer support did not significantly affect students' STAI-T levels during education. Further studies are needed to assess the anxiety and stress levels of students in the endodontic clinic.

**Keywords:** Anxiety; dental stress analysis; dental clinics; endodontics

**ÖZET Amaç:** Diş hekimliği eğitimi sırasında stres ve kaygı düzeyleri öğrencilerin performansını ve motivasyonunu olumsuz etkileyebilir. Bu nedenle, akran desteklerinin öğrencilerin psikolojik refahını artırarak eğitim sürecindeki katılım ve başarılarını arttırabileceği düşünülmektedir. Bu çalışmanın amacı, endodonti kliniğinde uygulamalı eğitim alan diş hekimliği öğrencilerinin, pratik eğitimi sırasında stres ve kaygı düzeylerini azaltıp azaltamayacağını belirlemektir. **Gereç ve Yöntemler:** Çalışma, endodonti kliniğinde pratik eğitim alan dördüncü sınıf diş hekimliği öğrencilerini içermektedir. Katılımcılar, akran desteği alanlar (çalışma grubu) (n=24) ve almayanlar (kontrol grubu) (n=24) olmak üzere iki gruba ayrılmıştır. "Klinik Stres Anketi" [Clinical Stress Questionnaire (CSQ)] ve "Durumluk-Sürekli Kaygı Envanteri" [State-Trait Anxiety Inventory (STAI-S, STAI-T)] her iki gruba da ön test ve son testte uygulanmıştır. Veriler SPSS 22 kullanılarak analiz edilmiştir. **Bulgular:** Son test ve ön test sonuçları arasındaki karşılaştırma, akran desteğinin çalışma grubunda durumluk kaygı puanlarında (STAI-S) önemli bir azalmaya neden olduğunu göstermiştir (p<0.05). Ancak, çalışma grubunda sürekli kaygı puanları (STAI-T) arasında anlamlı bir fark bulunmamıştır. Ek olarak çalışma grubu, ön test ile karşılaştırıldığında son testte toplam ortalama CSQ puanında istatistiksel olarak anlamlı bir azalma göstermiştir (p<0.05). **Sonuç:** Akran desteği, öğrencilerin eğitim sürecindeki STAI-S ve CSQ puanlarını azaltabilir. Ancak, akran desteğinin öğrencilerin eğitim sürecindeki STAI-T seviyelerini anlamlı bir şekilde etkilemediği görülmüştür. Endodonti kliniğindeki öğrencilerin kaygı ve stres düzeylerini değerlendirmek için daha fazla çalışma gerekmektedir.

**Anahtar Kelimeler:** Anksiyete; dental stres analizi; diş klinikleri; endodonti

**TO CITE THIS ARTICLE:**

Tosun S, Arslan HK, Ertuğrul İF. The impact of peer support on stress and anxiety levels of dental students: Cross-sectional research. Türkiye Klinikleri J Dental Sci. 2024;30(4):610-4.

**Correspondence:** Samet TOSUN

Pamukkale University Faculty of Dentistry, Department of Endodontics, Denizli, Türkiye

**E-mail:** samettosun06@gmail.com

Peer review under responsibility of Türkiye Klinikleri Journal of Dental Sciences.

**Received:** 18 Apr 2024

**Received in revised form:** 03 May 2024

**Accepted:** 08 May 2024

**Available online:** 20 May 2024

2146-8966 / Copyright © 2024 by Türkiye Klinikleri. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).



Dentistry education is a rigorous process that requires students to gain both theoretical knowledge and practical skills in order to effectively treat patients. However, the rigorous training process can also lead to elevated levels of stress and challenges for students, often resulting in experiences of anxiety and depression.<sup>1</sup> Research has consistently highlighted the vulnerability of dental students to mental health issues.<sup>2,3</sup> Addressing these concerns and providing support throughout their training is crucial for educators and healthcare providers.

Stress, anxiety, and depression are common among dentistry students and can have negative impacts on their clinical and academic performance.<sup>4</sup> These conditions may impair the development of positive relationships with faculty and peers, as well as impede effective problem-solving skills. Anxiety, in particular, poses challenges for both the dental practitioner and the patient.<sup>5</sup> To assess stress levels in dental students, various questionnaires and scales, such as the Clinical Stress Questionnaire (CSQ) and the State-Trait Anxiety Inventory (STAI), have been developed and utilized in research studies.<sup>4,6,7</sup>

In response to the need for enhancing students' clinical and mental skills competencies, contemporary dentistry education seeks alternative teaching methods in addition to traditional approaches. Among these methods, peer-supported education has gained popularity, particularly in undergraduate programs.<sup>8-12</sup> This educational model involves experienced individuals in a specific subject guiding beginners, providing them with knowledge, skills, and practical training. Numerous studies have demonstrated the positive effects of peer-supported education, including the reduction of stress and anxiety levels, increased self-confidence in practice, and overall personal and professional development.<sup>8,9</sup> Peer mentorship has also been extensively examined in various healthcare professions such as physiotherapy, nursing, physical therapy, and medicine.<sup>10-12</sup> However, there remains a gap in the literature regarding the effectiveness of peer-supported education in reducing anxiety and stress levels specifically during clinical practices among dental students. Furthermore, no studies have compared the anxiety and stress levels of dental students who underwent their

first endodontic internship with and without peer support. Therefore, this study aims to investigate the relationship between peer-supported and unaided stress and trait anxiety levels during endodontic clinical practices among dental students who are embarking on their first endodontic internship. The null hypotheses state that peer support has no impact on anxiety and stress levels among dental students who are engaging in endodontic practice for the first time.

In summary, understanding and addressing the mental health challenges faced by dental students is crucial for their overall well-being and success in their professional journey. Exploring the potential benefits of peer-supported education in reducing anxiety and stress levels can provide valuable insights for the development of effective support systems and educational strategies within dental education.

## MATERIAL AND METHODS

This study was approved by the Pamukkale University Non-Interventional Clinical Research Ethics Committee with the report (date: October 21, 2021; no: E-60116787-20-119858) and was conducted in accordance with the latest guidelines of the principles of the Declaration of Helsinki. The participants were 4<sup>th</sup> grade dental students receiving practical training at Pamukkale University Faculty of Dentistry, Department of Endodontics. Prior to the study, a G-power analysis was conducted with  $\alpha=0.05$ , power  $(1-\beta)=0.95$ , and an effect size of 0.745, resulting in a total of 48 trainees. The inclusion criterion was that students were attending the endodontic clinic for the first time. Informed consent forms were obtained from all participants prior to their enrollment in the study. Two groups were randomly selected from the students who received endodontic clinical internships at different times: the study group ( $n=24$ ) received peer support from two graduate students, while the control group ( $n=24$ ) did not. Both groups completed a 24-hour per week, one-month internship period. State (STAI-S) and trait (STAI-T) anxiety levels were measured using the STAI at the beginning and end of the clinic, and than the students completed the CSQ at both time points.

The CSQ contains 20 items rated on a 5-point scale from 0 ("not at all") to 4 ("a lot"). The mini-

mum and maximum scores are 0 and 80, respectively, with higher scores indicating higher levels of stress. STAI-S and STAI-T each consist of 20 items, with 10 direct and 10 reverse-scored items that evaluate different anxiety levels. The total anxiety score is calculated by adding 50 points for state anxiety and 35 points for trait anxiety. Anxiety scores range from 20 to 80, with higher scores indicating higher levels of anxiety.<sup>13,14</sup>

## STATISTICAL ANALYSIS

The data were analyzed using SPSS 22 (Chicago, IL, USA). Descriptive statistics were used to determine the mean, standard deviation, and frequency of the STAI-S, STAI-T, and CSQ scores. Normality of data distribution was assessed using visual and analytical methods, including the Shapiro-Wilks test. Parametric tests were used as the data showed normal distribution. Paired samples t-tests were used to compare pre- and post-test scores within each group. The significance level was set at  $p < 0.05$ .

## RESULTS

The study included 48 4<sup>th</sup>-grade dental students, with 24 in the study group and 24 in the control group. The average age was 21.67 years in the study group and 22.04 years in the control group (Table 1).

The study group showed a statistically significant decrease in STAI-S score between the beginning and end of the internship ( $p < 0.05$ ), while there was no significant difference in STAI-S score in control group ( $p > 0.05$ ) (Table 2). In contrast, the control group showed no significant differences in STAI-S or STAI-T score between the beginning and end of the internship ( $p > 0.05$ ) (Table 2). There was a statistically significant difference between the CSQ total score of the study and control groups at the pre-test and post-test ( $p < 0.05$ ) (Table 2).

## DISCUSSION

The objective of education programs is to minimize stress and anxiety among students and provide them with a quality education. Dentistry education is a challenging and intensive process, both practically and theoretically, for students. Studies have shown that anxiety and depression are more prevalent among dental students than students in the same age group, and clinical applications and examinations may contribute to these psychological issues.<sup>15,16</sup>

To measure anxiety and stress levels, we used STAI and CSQ. Due to its proven validity and reliability in the Turkish population, STAI is commonly used in Türkiye to assess patients' anxiety levels.<sup>17</sup>

**TABLE 1:** Demographic characteristics of students.

		Study group (n=24)		Control group (n=24)	
		Frequency (n)	%	Frequency (n)	%
Age	21	11	45.8	10	41.6
	22	8	33.3	9	37.5
	23	5	20.8	3	12.5
	25	-		2	8.3
Gender	Female	14	58.3	13	54.1
	Male	10	41.6	11	45.8

**TABLE 2:** State-trait anxiety and clinical stress levels of before and after clinical practice students.

Scale	Study group			Control group		
	Pre-test	Post-test	p values	Pre-test	Post-test	p values
STAI-S	44.62±9.23	30.92±7.57	0.000*	43.85±9.26	40.69±9.99	0.382
STAI-T	44.62±10.00	43.08±10.69	0.359	42.15±8.66	42.46±7.25	0.827
CSQ total	30.46±10.43	19.46±9.69	0.001*	32.38±6.09	20.62±7.00	0.002*

\* $p < 0.05$ ; STAI-S: State-Trait Anxiety Inventory-State; STAI-T: State-Trait Anxiety Inventory-Trait; CSQ: Clinical Stress Questionnaire.

CSQ is often used in studies that examine the pressure students experience during their first clinical practice.<sup>18</sup>

The results of a systematic review suggest that stress is a common issue among dental students.<sup>19</sup> Numerous studies have been conducted to help dental students manage stress during their education.<sup>20-23</sup> Some studies have investigated the reduction of clinical requirements as a way to reduce stress.<sup>20,21</sup> Previous research has mainly centered on individuals, proposing stress management courses as a solution to help students effectively manage the intense stress and pressures characteristic of dental school.<sup>22,23</sup>

Several studies have examined the anxiety and stress levels of students using the peer-supported education model.<sup>1,11,24,25</sup> Ravanipour et al. found that students' anxiety decreased significantly after working with mentors in clinical practice, and Topping has shown in her study that effective results are obtained when peer support is applied correctly.<sup>11,24</sup> Tambağ has demonstrated that peer support plays a crucial role in reducing anxiety levels among students.<sup>1</sup> Harden et al. also stated that peer support increases students' deep learning and self-learning skills while improving academic success.<sup>25</sup> However, it is important to note that there is a lack of stress and anxiety management interventions utilizing peer support in the field of dentistry.

This study is the first in our country to examine the effects of peer support on stress and anxiety levels in dentistry clinical education. The initial and final STAI-S score of the students who received peer support varied significantly between groups in our study. The decrease in STAI-S value at the beginning and end of the internship was higher in the group receiving peer support than the group not receiving peer support. Specifically, the study group that received peer support demonstrated a statistically significant reduction in state anxiety compared to the control group. This indicates that the presence of experienced peers who offer guidance and support can effectively reduce the stress and anxiety levels experienced by dental students during their clinical practices. However, there was no significant difference between the two groups in terms of STAI-T, indicating that peer support may not have a direct impact on long-term

anxiety tendencies among dental students. The reason for this may be attributed to the continuing education process of the students, short duration of the internship, or the interaction between the groups.

Su et al. found that mentoring reduced stress levels among nursing students during their initial clinical practice, which is consistent with our study.<sup>26</sup> However, peer support had no effect on CSQ values. Furthermore, in our study, stress levels also decreased in the group without peer support. The difference observed in our study may be attributed to the end of the internship. Li et al. examined the impact of peer counseling on stress among nursing students during clinical practice and found no significant difference between the study and control groups, which aligns with our findings.<sup>27</sup> Li et al. attributed this result to factors such as a limited sample size, insufficient data collection time, or interaction between the two groups.<sup>27</sup>

These findings highlight the potential benefits of implementing peer-supported education in dental training programs to enhance students' well-being and overall clinical performance. By offering guidance, knowledge, and practical training, experienced peers can contribute to reducing stress and anxiety levels, thus promoting a positive learning environment for dental students.

Despite the promising findings, it is important to note the limitations of our study. First, the sample size was relatively small, consisting of only 48 dental students from a single institution. This may limit the generalizability of our findings to a larger population of dental students. Additionally, the duration of the internship was relatively short, lasting only one month. Therefore, the impact of peer support on long-term anxiety tendencies among dental students remains unclear. Moreover, other factors such as the students' prior experiences, individual coping mechanisms, and external stressors may have influenced the results and should be considered. Further research with larger sample sizes, longer follow-up periods, and consideration of these additional factors is needed to validate our findings and provide a more comprehensive understanding of the effects of peer-supported education on stress and anxiety levels among dental students.

## CONCLUSION

In conclusion, this study found that peer support was effective in decreasing state anxiety levels of students during endodontic education. However, it did not have a significant impact on their trait anxiety levels. Further research is necessary to better understand and address stress and anxiety levels in students in endodontic clinics.

### Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

### Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

### Authorship Contributions

**Idea/Concept:** Samet Tosun; **Design:** Samet Tosun; **Control/Supervision:** Samet Tosun, Kübra Havva Arslan; **Data Collection and/or Processing:** Kübra Havva Arslan; **Analysis and/or Interpretation:** Samet Tosun, İhsan Furkan Ertuğrul; **Literature Review:** Samet Tosun, İhsan Furkan Ertuğrul; **Writing the Article:** Samet Tosun; **Critical Review:** İhsan Furkan Ertuğrul; **References and Fundings:** Kübra Havva Arslan; **Materials:** Kübra Havva Arslan.

## REFERENCES

- Tambağ H. Examination of nursing students' anxiety levels related to clinical practice with respect to peer support. *Perspect Psychiatr Care*. 2021;57(3):1114-9. [Crossref] [PubMed]
- Basudan S, Binanzan N, Alhassan A. Depression, anxiety and stress in dental students. *Int J Med Educ*. 2017;8:179-86. [Crossref] [PubMed] [PMC]
- Rada RE, Johnson-Leong C. Stress, burnout, anxiety and depression among dentists. *J Am Dent Assoc*. 2004;135(6):788-94. [Crossref] [PubMed]
- Alzahem AM, van der Molen HT, Alaujan AH, Schmidt HG, Zamakhshary MH. Stress amongst dental students: a systematic review. *Eur J Dent Educ*. 2011;15(1):8-18. [Crossref] [PubMed]
- Almalik M, Alnowaiser A, El Meligy O, Sallam J, Balkheyour Y. clinical anxiety among saudi postgraduate pediatric dentistry students in jeddah city. *Int J Dent*. 2018;2018:5863869. [Crossref] [PubMed] [PMC]
- Pagana KD. Psychometric evaluation of the Clinical Stress Questionnaire (CSQ). *J Nurs Educ*. 1989;28(4):169-74. [Crossref] [PubMed]
- Gluczek A, Henriques JB, Brown RL. Support for the reliability and validity of a six-item state anxiety scale derived from the State-Trait Anxiety Inventory. *J Nurs Meas*. 2009;17(1):19-28. PMID: PMC2776769. [Crossref]
- Mills DA, Hammer CL, Murad A. Power of peers: students' perceptions of pairing in clinical dental education. *J Dent Educ*. 2017;81(1):36-43. [Crossref] [PubMed]
- Noonan MJ, Ballinger R, Black R. Peer and faculty mentoring in doctoral education: definitions, experiences, and expectations. *International Journal of Teaching and Learning in Higher Education*. 2007;19(3):251-62. [Link]
- Secomb J. A systematic review of peer teaching and learning in clinical education. *J Clin Nurs*. 2008;17(6):703-16. [Crossref] [PubMed]
- Ravanipour M, Bahreini M, Ravanipour M. Exploring nursing students' experience of peer learning in clinical practice. *J Educ Health Promot*. 2015;4:46. [Crossref] [PubMed] [PMC]
- Tai JH, Canny BJ, Haines TP, Molloy EK. The role of peer-assisted learning in building evaluative judgement: opportunities in clinical medical education. *Adv Health Sci Educ Theory Pract*. 2016;21(3):659-76. [Crossref] [PubMed]
- Ulusoy M, Sahin NH, Erkmen H. Turkish version of the Beck Anxiety Inventory: psychometric properties. *Journal of Cognitive Psychotherapy*. 1998;128(2):163-72. [Link]
- Julian LJ. Measures of anxiety: State-Trait Anxiety Inventory (STAI), Beck Anxiety Inventory (BAI), and Hospital Anxiety and Depression Scale-Anxiety (HADS-A). *Arthritis Care Res (Hoboken)*. 2011;63 Suppl 11(0 11):S467-72. [Crossref] [PubMed] [PMC]
- Uraz A, Tocak YS, Yozgatligil C, Cetiner S, Bal B. Psychological well-being, health, and stress sources in Turkish dental students. *J Dent Educ*. 2013;77(10):1345-55. [Crossref] [PubMed]
- Al-Sowaygh ZH, Alfadley AA, Al-Saif MI, Al-Wadei SH. Perceived causes of stress among Saudi dental students. *King Saud University Journal of Dental Sciences*. 2013;4(1):7-15. [Crossref]
- Öner N, LeCompte AW. *Durumluk-Süreklilik Kaygı Envanteri El Kitabı*. 1st ed. İstanbul: Boğaziçi Üniversitesi Yayınları; 1983.
- Sendir M, Acaroglu R. Reliability and validity of Turkish version of clinical stress questionnaire. *Nurse Educ Today*. 2008;28(6):737-43. [Crossref] [PubMed]
- Elani HW, Allison PJ, Kumar RA, Mancini L, Lambrou A, Bedos C. A systematic review of stress in dental students. *J Dent Educ*. 2014;78(2):226-42. [Crossref] [PubMed]
- Hicks JL, Dale RA, Hendricson WD, Lauer WR. Effects of reducing senior clinical requirements. *J Dent Educ*. 1985;49(3):169-75. [Crossref] [PubMed]
- Piazza-Waggoner CA, Cohen LL, Kohli K, Taylor BK. Stress management for dental students performing their first pediatric restorative procedure. *J Dent Educ*. 2003;67(5):542-8. [Crossref] [PubMed]
- Shugars DA. A fitness course for dental students. *J Dent Educ*. 1981;45(5):300-2. [Crossref] [PubMed]
- Dodge WW, Dale RA, Hendricson WD. A preliminary study of the effect of eliminating requirements on clinical performance. *J Dent Educ*. 1993;57(9):667-72. [Crossref] [PubMed]
- Topping KJ. The effectiveness of peer tutoring in further and higher education: a typology and review of the literature. *Higher Education*. 1996;32(3):321-45. [Crossref]
- Harden RM, Laidlaw JM. *Helping the student to learn (The teacher's toolkit). Essential Skills For A Medical Teacher: An Introduction To Teaching And Learning In Medicine*. 3rd ed. Amsterdam: Elsevier Health Sciences; 2020. p.141.
- Sü S, Özlük B, Demirören N. Effects of mentoring in reducing clinical stress levels of nursing students during experiences in their first clinical practice. *Journal of Human Sciences*. 2018;15(1):280-92. [Crossref]
- Li HC, Wang LS, Lin YH, Lee I. The effect of a peer-mentoring strategy on student nurse stress reduction in clinical practice. *Int Nurs Rev*. 2011;58(2):203-10. [Crossref] [PubMed]