

Comparison of Stress Level between Endodontists, General Dentists, Postgraduate and Undergraduate Students during Endodontic Therapy

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Abstract

Background and Aim: Stress in the dental profession is a recognized challenge, and endodontics, with its unique challenges, often stands out as a particularly stressful specialty. The demand for consistent, high-quality results without immediate feedback or the ability to track progress as easily as in other professions can exacerbate the pressure. This study was conducted to compare stress levels in various stages of root canal treatment (RCT) in endodontists, endodontic residents, specialists from other branches of dentistry, residents from other branches of dentistry, general dentist and in students of general dentistry course and to assess the most and the least stressful stages of RCT. **Materials and Methods:** In this ex-post facto investigation, five groups including professional endodontists ($n = 16$), specialists from other branches of dentistry ($n = 16$), general dentist ($n = 16$), postgraduate dental students ($n = 16$), and undergraduate dental students ($n = 16$) were involved by convenience sampling. A questionnaire with four-point scales (no stress at all to severe stress) was prepared for this study based on Google Forms. The questionnaire was filled out by participants in a self-report method. **Results:** Data analysis showed severe stress in UG and PG students from other branches, whereas general dentists experienced moderate-to-severe stress. Master of dental surgery students from other branches had mild-to-moderate stress, and PG endodontics students and endodontists reported no stress to mild stress during different stages of RCT. The highest stress across all groups occurred during the preparation of curved and calcified canals. **Conclusion:** It is crucial to focus more on addressing stress among students while also recognizing the lower stress levels in endodontic specialists and residents. Organizing engaging workshops and innovative learning projects can be effective strategies to help reduce stress and promote overall well-being.

Keywords: Endodontic therapy, Endodontists, General dentist, Stress level.

INTRODUCTION

Stress is a reaction to adapt the individuals to factors and conditions that cause mental and/or physical pressure.^[1] Pioneering researcher Hans Selye broadly defined stress in the 1930s as anything unpleasant, harmful, or excessively grueling.^[2,3] In the workplace, experts often link stress to overwhelming demands, coupled with an individual's perceived lack of organizational skills or control over their circumstances.^[4]

Dentistry is frequently cited as a particularly stressful occupation.^[5,6] This is often attributed to the inherent nature of clinical work, the specific work environment, and even the individual dentist's personality. The confined and intricate space of the oral cavity further intensifies this pressure.^[7-10]

Among various dental procedures, endodontic (root canal) treatments are a notable source of occupational stress for

dentists, dentistry students, and endodontists alike. Key contributing factors include the lack of direct visibility into the treatment area and the complex, variable anatomy of the root canal system.^[11] Fortunately, research indicates that a proactive approach can mitigate the effects of stress, and a dentist's stress levels tend to decrease with increased experience.

Aim of the study

This study was conducted to compare stress levels in various stages of root canal treatment (RCT) in endodontists,

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endodontic residents, specialists from other branches of dentistry, residents from other branches of dentistry, general dentist, and in students of general dentistry course and to assess the most and the least stressful stages of RCT.

MATERIALS AND METHODS

In this survey-based study, six groups including professional endodontists ($n = 30$), specialists from other branches of dentistry ($n = 21$), endodontic residents ($n = 24$), residents from other branches of dentistry ($n = 40$), general dentist ($n = 33$) and undergraduate dental students ($n = 27$) were involved by convenience sampling. A questionnaire comprised of 33 questions with four-point scales (no stress at all to highly stressful) was prepared for this study based on Google Forms. The questionnaire was filled out by participants using a self-report method.

A questionnaire contained the following 33 questions:

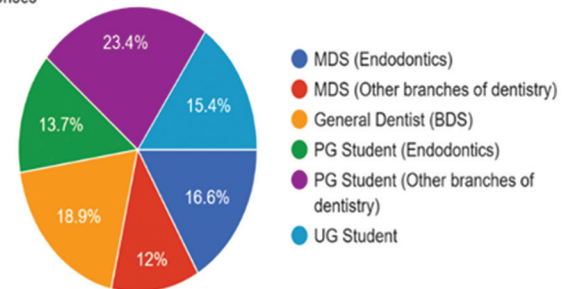
1. Do you perform RCTs in your daily practice?
2. Is performing RCT stressful?
3. Do you use rubber dam isolation during RCT?
4. If yes, do you find application of rubber dam stressful?
5. Do you find delivering local anesthesia stressful?
6. Is achieving profound anesthesia stressful?
7. Do you feel stressed about creating perforation while accessing the opening?
8. Do you find locating all the canals stressful?
9. Do you find determining working length by radiovisiography/intraoral periapical radiograph stressful?
10. Do you find determining working length by electronic apex locator stressful?
11. Do you find determining the working length in case of open apex stressful?
12. Do you find determining working length in case of apical resorption stressful?
13. Do you find root canal therapy of vital pulp stressful?
14. Do you find root canal therapy of non-vital pulp stressful?
15. Do you find using 5.25% NaOCl as an irrigant stressful?
16. Do you feel stressed about pushing irrigant beyond apex?
17. Do you find biomechanical preparation with hand instrumentation stressful?
18. Do you find biomechanical preparation with rotary instrumentation stressful?
19. Do you find preparing curved or calcified canals stressful?
20. Do you feel stressed about the management of losing length or blocking the apex?
21. Do you feel stressed about instrument separation or ledge formation, or canal transportation?
22. Do you feel stressed about extrusion of intracanal medicament?
23. Do you find removal of intracanal medicament stressful?
24. Do you feel stressed about mid-treatment flare-ups?
25. Do you feel stressed about extrusion of Sealer?
26. Do you feel stressed about maintaining isolation during obturation if you are not using a rubber dam?
27. Is obturating the root canal with the lateral condensation technique stressful?
28. Do you feel stressed about pushing gutta-percha beyond the apex or having porosity with warm vertical condensation technique?
29. Is obturating the root canal with single cone obturation technique stressful?
30. Do you feel stressed about gutta-percha coming out while sealing the root canal?
31. Do you feel stressed about a patient complaining of post-obturation pain?
32. Do you feel stressed about restoring a badly broken-down tooth after endodontic treatment?
33. Do you feel stressed about retention of post-endodontic restoration?

Study design

The Google Forms questionnaire was prepared in segments, which included the information of the 175 participants and their designation.

Designation

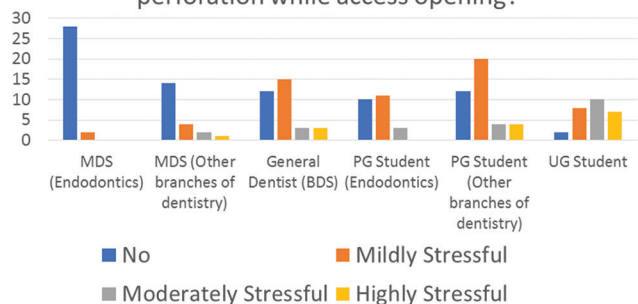
175 responses



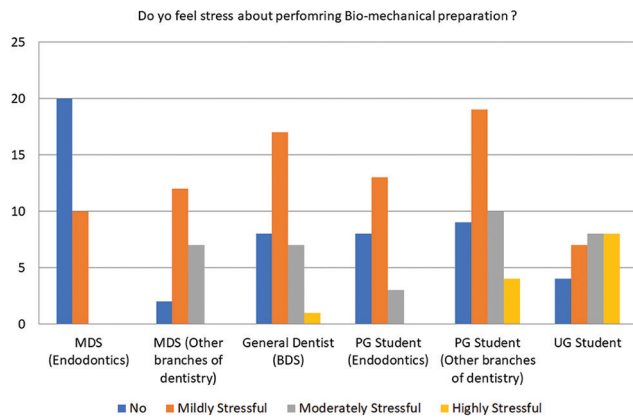
RESULTS

The first segment included questions regarding stress related to performing the access opening of all the canals.

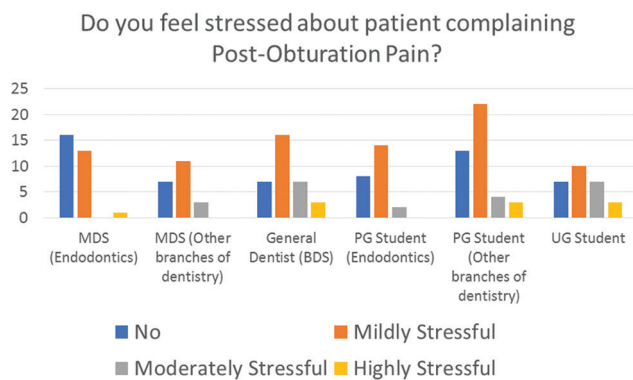
Do you feel stressed about creating perforation while access opening?



The next segment included questions regarding stress related to the biomechanical preparation of the tooth.



The last segment included questions regarding stress related to obturation and post-endodontic restoration.



DISCUSSION

An ex-post facto design was used in this study, where the study population consisted of six groups. This study included a total of 175 participants, comprising 30 endodontists, 21 specialists from various dental branches, 33 general dentists, 24 endodontic residents, 40 residents from other dental specialties, and 27 undergraduate dental students. The sample size was determined based on recommendations for comparison between ex-post facto study groups.^[12] For the purposes of measuring stress levels during endodontic treatments in the six groups, a 33-item questionnaire with a 4-degree scoring system (no stress at all to severe stress) was devised and prepared based on a Google Form shared among specialists, residents, and students.

The current study indicated that undergraduate students experienced the highest levels of stress related to performing access openings compared to other groups. No moderate or high stress levels were observed among professional endodontists, while 6.66% of them experienced mild stress. Among master of dental surgery (MDS) students in other dentistry specialties, 66.66% reported no stress, 19.04% experienced mild stress, 9.52% had moderate stress, and only 4.76% reported high stress. For general dentists, mild stress was most common at 45.45%, with 9.09% experiencing moderate or no stress. In PG endodontics students, no high stress was found; 45.83%

reported mild stress, and 12.5% experienced moderate stress. Among PG students in other dental branches, 50% reported mild stress, and 10% experienced moderate or high stress. Undergraduate students showed high stress levels in 25.92%, with 37.03% experiencing moderate stress. This finding was consistent with the study by Veersangappa *et al.*, which also identified similar stressors, as opening the access cavity requires a thorough understanding of tooth anatomy and its variations.^[13]

The current study revealed that undergraduate students, along with postgraduate students from various dental specialties and general dentists, experienced the highest levels of stress regarding the biomechanical preparation of teeth. The study found that no moderate or high stress levels were observed among professional endodontists, while 33.33% experienced mild stress. Among MDS students in other dentistry specialties, 9.52% reported no stress, 57.14% experienced mild stress, 33.33% had moderate stress, and no participants reported high stress. For general dentists, mild stress was the most common at 51.51%, followed by no stress at 24.24%, and moderate stress at 21.21%. In PG endodontics students, no high stress was observed; 54.16% reported mild stress, and 12.5% experienced moderate stress. Among PG students in other dental branches, 47.5% reported moderate stress, while 25% experienced high stress. Undergraduate students showed moderate and high stress levels in 29.62% of cases each. General dentists exhibited elevated levels of stress. The findings were similarly observed in the research conducted by Jahromi *et al.* 2012, suggesting that the lack of tactile sensation among undergraduate and postgraduate students from various disciplines may contribute to this outcome.^[14] In contrast, endodontists and endodontic residents appear to develop these skills more readily due to their enhanced training and experience.

The current study observed that a significant level of stress was experienced predominantly during the preparation of curved and calcified canals across all groups, with the exception of endodontic residents, who reported moderate stress levels. In contrast, endodontists exhibited only mild stress, aligning with findings from Radillo *et al.* in 2008.^[3] The improvement in outcomes can be attributed to a deeper understanding of root canal anatomy and its variations, alongside advancements in specialized instruments designed for the preparation of these complex canals. This knowledge helps in minimizing errors among endodontists and endodontic residents.

The current study reveals that instrument separation, ledge formation, and canal transportation posed significant stress for undergraduate students. In contrast, general dentists, postgraduate students, and specialists from other branches experienced moderate stress levels, whereas endodontic postgraduate students reported mild stress. Interestingly, endodontists reported no stress at all, aligning with findings from Newton *et al.* in 2006.^[8] These challenges can be addressed through techniques such as instrument bypass or

retrieval, methods that are more familiar to endodontists and endodontic residents due to their specialized training.

The process of obturation using lateral condensation, warm vertical condensation, and the single cone technique proved to be significantly stressful for undergraduate students, general dentists, and postgraduate students from various disciplines. In contrast, endodontists and endodontic residents reported a markedly lower level of stress during these procedures. The results of the findings align with the study conducted by Dagli *et al.* in 2009, which suggested that the observed outcomes may stem from a fear of failure during certain stages of RCT, ultimately leading to challenges in accurately diagnosing the underlying issues for effective management.^[9]

All groups, with the exception of endodontists, reported that the obturation technique and post-endodontic restoration were less stressful. The study revealed that no moderate stress was observed among professional endodontists, while 30% experienced mild stress. In MDS students from other dental branches, 42.85% reported no stress, 42.85% experienced mild stress, 9.52% had moderate stress, and 4.76% reported high stress. Among general dentists, mild stress was most common at 45.45%, followed by no stress at 30.30%, and moderate stress at 15.15%. In PG endodontics students, no high stress was observed; 50% reported mild stress, and 8.3% experienced moderate stress. For PG students in other dental branches, 45% reported mild stress, and 7.5% experienced moderate stress. Undergraduate students showed moderate and high stress levels in 11.11% and 14.8% of cases, respectively. This finding aligns with the study conducted by Pozos-Radillo *et al.* in 2010.^[6] Conversely, no stress was reported by endodontists and endodontic postgraduate students, likely due to their advanced knowledge of various treatment modalities, such as post-and-core techniques and other methods for restoring such teeth.

The current study reveals that undergraduate students experience a significant level of stress regarding post-obturation pain. In contrast, general dentists and postgraduate students from various disciplines exhibit moderate stress levels. Endodontic residents and specialists from other fields report mild stress, whereas endodontists themselves show no signs of stress related to this issue.

Establishing a positive rapport between patients and dentists, along with consistent attendance, can significantly alleviate stress for dental professionals. Rada *et al.* proposed various strategies for alleviating occupational stress. These include identifying stress in patients, implementing effective time management techniques, and utilizing approaches such as hypnosis, desensitization, and relaxation.^[10] In addition, fostering a strong dentist–nurse relationship and supporting one another, along with ensuring adequate rest, are emphasized as crucial components in this process.^[5] The findings align closely with the recommendations put forth by the participants in this study.

A study conducted by Jahromi *et al.* in 2012 revealed that undergraduate dental students experienced higher levels of stress

compared to their professional counterparts and postgraduate dental students.^[14] A study conducted by Ali *et al.* in 2015 highlighted that dental students may experience phobias associated with various dental procedures.^[15] However, the research faced limitations, including a small sample size and data that were representative of only participants of Ahmedabad city.

The treatment nature, variations, complications of the root canal system, and the challenges of managing anxious patients who report pain contribute to stress in this field. Consequently, both dentists and students encounter significant stress during endodontic procedures. Weathers indicated that disorganized endodontic treatment leads to stress and confusion. To achieve organization in endodontics, he proposed the establishment of reproducible systems for each procedure and recommended 10 specific systems for endodontic practice.

CONCLUSION

According to the findings in this study, stress control must be focused on UG students and general dentists. For students, stress control training during dental education, and stress control techniques for general dentists, through workshops, are recommended.

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