



PERCEPTION OF THE CLINICAL ENDODONTIC PRACTICE OF DENTISTRY GRADUATES IN THEIR FIRST YEARS IN THE JOB MARKET IN SOUTHERN BRAZIL

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ABSTRACT

Introduction: Knowledge about the clinical endodontic practices of dental school graduates in the first years of their professional life may contribute to the discussions about Dentistry teaching.

Methods: An online questionnaire with seven open and closed questions hosted on the Google forms platform was applied to dentists trained in the first half of 2019 in a School of Dentistry in southern Brazil. The questionnaire is structured to analyze how clinical Endodontics has been practiced in the labor market. The data collected in the questionnaires were transferred to an Excel® spreadsheet and analyzed as absolute and relative frequencies for closed questions and descriptions for open questions.

Results: Molars and two-rooted teeth are the dental groups most frequently treated endodontically (64.3% and 35.7%). Both retreatment and conservative treatment of the pulp corresponded to up to 25% of all procedures in the graduates' clinical practice. The endodontic protocol learned in their dental school was used by 64.3% of the graduates who provided endodontic treatments, and 42.9% reported the occurrence of at least one accident. The difficulty in access reported by the participants suggests that more training should be provided for this operative stage.

Conclusions: After two years in the job market and having faced the initial difficulties existing in any profession, more than half of the graduates still performed endodontics in their dental clinical practice and used the same protocols learned in dental school.

KEYWORDS: Endodontics. Teaching. Surveys and questionnaires. Dental practice.

INTRODUCTION

Endodontics is the area of Dentistry that studies the causes, prevention, diagnosis and treatment

of the dental pulp and how it affects the periapical tissues. According to Seijo et al.¹, the process of acquiring skills and abilities in this specialty

may be complex because of procedural difficulties, responsibilities inherent to patient care and students' lack of self-confidence.

In 2013, the European Society of Endodontology published the Undergraduate Curriculum Guidelines for Endodontic Training, which provides information on the minimum level of competence to be achieved at the undergraduate level². In the same year, the American Endodontic Association (AAE) published the requirements and skills required for all dentists that work with Endodontics³. In Brazil, the National Curriculum Guidelines do not specify criteria for the organization of the curricular structure for the teaching of Endodontics in dental school, and, therefore, different approaches to the amount and distribution of endodontic training have been adopted.

In addition to curriculum and undergraduate teaching, managers and educators are concerned with the market insertion and professional practices of recent graduates. Understanding how Endodontics is practiced in the market in view of the demands and difficulties experienced by graduates may provide data to guide the organization of a more adequate professional training of future dentists.

Therefore, to gather more information and gain a better understanding, this study collected data about the clinical endodontic practices of graduates from a School of Dentistry in southern Brazil in the first two years after joining the job market.

MATERIALS AND METHODS

This study was approved by the Research Ethics Committee (CAAE, 44713221.0.0000.5347) of the institution where it was conducted.

Study sampling

This study recruited participants using non-probabilistic convenience sampling methods. All students who graduated from a School of Dentistry in southern Brazil in the

Table 1. Questionnaire applied to study participants.

Question 1	Do you provide endodontic treatments in your clinical practice? () Yes () No
Question 2	Of all the endodontic treatments that you perform, what percentage corresponds to retreatments? () 0% of cases () 1% to 25% of cases () 26% to 50% of cases () 51% to 75% of cases () 76% to 100% of cases
Question 3	Of all the endodontic treatments that you perform, what percentage corresponds to conservative pulp treatments? () 0% of cases () 1% to 25% of cases () 26% to 50% of cases () 51% to 75% of cases () 76% to 100% of cases
Question 4	Which tooth groups do you treat endodontically most often: () Single-rooted anterior teeth () Two-rooted teeth () Molar teeth () I do not see a predominance of any specific tooth group
Question 5	Which step(s) of an endodontic treatment is(are) the most difficult for you to perform? _____
Question 6	In your clinical practice after graduation, has you ever had an endodontic accident? () Yes () No What accident(s)? _____
Question 7	In your clinical practice, have you made any changes to the endodontic treatment protocol that you were taught in Dental School? () Yes () No What changes? _____

first semester of 2019 were invited to participate in the study by email.

After reading the invitation letter and the free and informed consent form, the graduates should state their interest and agreement to participate in the study. After 30 days, graduates who had not responded to the invitation were sent another email message with the same content but extending the deadline for another 30 days. All dentists who sent their answers within 60 days were included in the sample. Two attempts were made to contact possible study participants.

Questionnaire

Participants who agreed to be part of the study answered an online questionnaire especially designed for this study and hosted on the Google Forms Platform. The questionnaire consisted of seven open questions and multiple-choice questions (**Table 1**) about clinical endodontic practices in the job market.

Data analysis

The data collected in the questionnaires were transferred to a spreadsheet (Excel, Microsoft). Data were analyzed using absolute and relative frequencies for closed questions and descriptions for open questions.

RESULTS

Of the 57 graduates contacted, 25 (43.85%) agreed to participate in the study and answered the questionnaire.

Table 2 shows the absolute and relative frequencies of the answers obtained in the closed questions. Slightly more than half of the respondents (56%) provided endodontic therapies in their dental practice. Molars and two-rooted teeth were the dental groups most frequently treated endodontically for 64.3% and 35.7% of the respondents. The stage of conventional endodontic treatment that posed the greatest

Table 2. Absolute and relative frequencies of answers obtained in the closed questions of the questionnaire.

Questionnaire	Values	
	Absolutes	Relatives
Do you still do endodontics in your clinical practice?		
*Yes	14	56%
*No	11	44%
Of all the endodontic treatments you perform, what percentage do the retreatments correspond to?		
* 0% of cases	4	28.6%
* 1% to 25% of cases	9	64.3%
* 26% to 50% of cases	0	0%
* 51% to 75% of cases	0	0%
* 76% to 100% of cases	1	7.1%
Of all the endodontic treatments you perform, what percentage of conservative pulp treatments are performed?		
* 0% of cases	4	28.6%
* 1% to 25% of cases	10	71.4%
* 26% to 50% of cases	0	0%
* 51% to 75% of cases	0	0%
* 76% to 100% of cases	0	0%
Which dental groups do you endodontically treat most often?		
() Single-rooted anterior teeth	0	0%
() Biradicular teeth	5	35.7%
() Molar teeth	9	64.3%
() I do not observe a predominance of a specific dental group	0	0%
In your clinical practice after graduation, has there ever been an endodontic accident?		
*Yes	6	42.9%
*No	8	57.1%
Have you made any changes in your clinical practice in relation to the endodontic treatment protocol taught in college?		
*Yes	5	35.7%
*No	9	64.3%

difficulty was access (8 respondents), followed by filling (4 respondents), cleaning and shaping (1 respondent) and working length determination (1 respondent).

Both retreatment and conservative treatment of the pulp represented practically the same proportion of the clinical practice of graduates, at 1% to 25% of all cases treated.

About half of the graduates reported an endodontic accident, such as failure in anesthetic block (1 respondent), sodium hypochlorite extrusion during irrigation (1 respondent), furcation perforation (1 respondent) and fracture of the endodontic file during cleaning and shaping (2 respondents).

Most respondents (64.3%) followed what was taught in dental school, and the changes made by the other 35.7% included the use of mechanical preparation with nickel-titanium files, a different apical limit for preparation and obturation, and foraminal enlargement during cleaning and shaping.

DISCUSSION

Planning and evaluating the teaching of Endodontics requires knowledge about the clinical practices of endodontists as they join the job market to care for the needs of society.

In this study, endodontic retreatment and conservative treatment of the pulp were the least frequent types of clinical practices. Kunert et al.⁴ evaluated the medical records of three endodontic specialists and found that, of 24,553 treatments at different times, retreatments represented 23% of their routine, which is in agreement with the findings of this study. The objective of a conservative treatment of the pulp is to preserve the integrity of the pulp tissue and as much healthy tooth structure as possible. There are four different types of conservative treatments: indirect pulp capping, direct pulp capping, pulp curettage and pulpotomy. The low frequency of conservative treatments in the endodontic routine in this study may be justified by the fact that these are clinical interventions routinely performed by other dental specialists.

Pulp capping is usually performed in restorative dentistry, and pulpotomy, in pediatric dentistry to treat young permanent teeth.

The teeth most frequently treated endodontically were the molars. Similar findings were reported by Dörr et al.⁵, and Ehlert and Luisi⁶ in studies conducted in southern Brazil. The first molars may be the teeth most affected by carious lesions because of their long period of eruption, when cariogenesis may begin. This may explain why this dental group had a high prevalence of cases in this study.

Endodontic treatments consist of several operative steps related to each other, all with the main objective of achieving clinical success. Of the stages of conventional endodontic treatment, access was considered the most technically difficult, followed by endodontic filling. A correct access requires solid knowledge of internal dental anatomy, careful analysis of the initial or diagnostic radiograph, and substantial laboratory and clinical training. In 1998, Simi Júnior et al.⁷ analyzed the difficulties of undergraduate students in the different stages of endodontic treatments using a sample of 740 treatment plans and interviews. They determined that the greatest difficulties were: access to the pulp chamber and finding canal orifices (27.02%), root canal preparation (24.33%), endodontic filling (18.92%), endodontic retreatment (16.22%), and working length determination (13.51%). Weinfeld⁸ evaluated the preclinical work of undergraduates on extracted human teeth, and found that filling was the most unsuccessful step, followed by access, cleaning and shaping, and, finally, working length determination. Carrying out clinical activities and constant training in the undergraduate curriculum, factors that determine and modulate self-confidence, are key aspects of the practices of dental students⁹. In the United Kingdom, endodontic training

and teaching time in the undergraduate curricula have increased considerably in the last two decades, as the importance of constant endodontic practicing by the student has been recognized¹⁰.

Accidents and complications may occur during the stages of endodontic treatment because of the anatomical complexity of the teeth, poor knowledge about the mechanical properties of endodontic instruments and technical procedures, and lack of professional skills. However, accidents during an endodontic treatment may happen to very experienced professionals, as well as to those with little experience. In this study, about half of the graduates who performed endodontic treatments had already had at least one endodontic accident. The accidents reported by the participants included fractures of the endodontic file and tooth perforations. According to Alrahabi et al.¹¹, the main accidents when dentists perform endodontic treatments are perforations and file fractures. Another accident mentioned by the graduates was sodium hypochlorite extrusion during irrigation, with an immediate clinical repercussion. Extrusion beyond the apical foramen, that is, into the periapical tissues, causes immediate clinical manifestations, such as inflammation, intense pain and instant edema^{12,13}.

In their professional clinic, most respondents (64.3%) used the endodontic treatment protocol that was taught in dental school. This may be explained by the fact that the teaching-learning process in educational institutions creates a practical dental routine. The acquired operative techniques can be repeated, thus conferring competence and confidence to the professional. Competence in clinical practice should not be seen only as an achievement, but rather as a lifelong learning habit¹⁴. At the same time, learning about new materials and treatment

protocols, and thus acquiring experience in their use, is extremely beneficial. Endodontics is a dental specialty that features numerous treatment philosophies, materials and equipment with the common objective of achieving clinical endodontic success. The graduates adopted some changes to the endodontic practices learned in school, such as mechanical preparation with nickel-titanium instruments, different apical limit of preparation and filling, and foraminal enlargement during cleaning and shaping. All these changes were associated with students who continued their studies in a graduate course, such as a specialization course in Endodontics, in institutions different from the one from which they had first graduated. Professionals dedicated to constant improvement should adopt new treatment alternatives, based on scientific evidence, after in-depth studies associated with laboratory training.

The number of respondents may be a limitation of this study. However, response rates are usually low. Bolfoni et al.¹⁵ reported that only 4.44% (615/13,853) of Brazilian endodontists responded to an online questionnaire to investigate antibiotic prescribing patterns in specific clinical situations. In a recent study, Moraes et al.¹⁶ found that response rates were only 2.1% and 20.7% for email and Instagram recruitment. Further analyses should be conducted to investigate the inclusion of qualitative methods, such as interviews and focal groups, in future studies. The use of these techniques may provide details about teaching practices and explore the experiences and reasons for teaching a specific technique, considering the uniqueness of each academic environment.

CONCLUSION

The responses to the questionnaires applied indicated that most graduates still performed the

clinical protocols taught in their undergraduate course. Findings revealed that molars were the group of teeth most often treated endodontically, and that access was the most difficult stage. About half of the graduates had at least one endodontic accident. Retreatment and conservative treatment of the pulp were the least frequent procedures in their clinical practice.

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