

Brazilian advanced specialty programs in endodontics: characteristics and distribution

Matheus Luis Reolon*; Camila Hélen Grock*; Renata Grazziotin-Soares,*; Francisco Montagner*

* Graduate Program, Faculdade de Odontologia, Universidade Federal do Rio Grande do Sul

** College of Dentistry, University of Saskatchewan, Canada

Received: 08/24/2021. Approved: 02/24/2022.

ABSTRACT

The existence of several Endodontics specialty programs in Brazil is known. However, there was no precise information regarding their geographic distribution, duration, workload and the profiles of the program's directors. There was also no means to determine if the requirements defined by the country's legal bodies were fulfilled by the institutions. The present cross-sectional study was conducted to bring together characteristics and peculiarities of all Brazilian endodontics advanced specialty programs, searching for information on the regulatory-agencies webpages and other venues. We searched the Ministry of Education's website to locate information such as geographical location, duration (months), number of hours, and program director professional degree profile. Program's homepages were searched to collect additional information – frequency, periodicity, costs, number of faculties. The searches were made between August 2019 and October 2019, identifying 505 registered programs and 117 specific program's websites. It was observed that 39% of the programs are in the Southeast region and 61.2% have a duration of 24 months. Additionally, a majority of the program's directors were male, accounting for 69.1% of the sample. The most common highest qualification held by them was a Masters' degree (45.1%). Regarding the 117 programs that had specific websites, they presented insufficient information, for instance: the frequency was only reported in 81 programs/websites, the number of teachers only in 51, and total fees only in 65. It was concluded that there are various Endodontic specialization programs in Brazil, benefiting the different students' profiles. Also, there is a lack of clear information on some programs.

Descriptors: Endodontics. Health Postgraduate Programs. Specialization.

1 INTRODUCTION

Endodontics advanced graduate programs in Brazil have been offered since the 1960's. Endodontics was recognized as a specialty in 1963, at the 104th American Dental Association General Assembly and was regulated in Brazil by Federal Dental Council Resolution CFO-90, published on

June 14, 1975. Nowadays, Brazilian endodontics advanced graduate programs are classified as *lato sensu* or *stricto sensu*. *Lato sensu* programs are designed for professionals seeking to develop evidence-based practice and advanced clinical skills, enabling the person to become a certified specialist. This type of program (or similar) may be

named 'Diploma in Endodontics' in other countries. *Stricto sensu* programs provide formal qualifications for students to become educators and researchers in dentistry/endodontics^{1,2}, since these programs focus on research knowledge skills and the production of a Master thesis or PhD dissertation.

Both graduate programs *lato sensu* and *stricto sensu* must be accredited by two legal bodies: Ministry of Education and Federal Dental Council. The Ministry of Education is a federal government department that regulates all legislation relating to teaching-learning practices in the country. The Federal Dental Council supervises and regulates dental surgeons' activities (private practice, companies and corporations) and assists *lato sensu* and *stricto sensu* programs to reach excellence (technical, infrastructural and scientific matters). The most recent regulatory document published by the Ministry of Education is from 2018. This document specifies general guidelines for graduate programs (not only in Dentistry, but also in other health care areas), including *lato sensu*/dentistry advanced specialty programs³. The most recent regulatory document published by the Federal Dental Council is dated from 2012 and it sets the required standards for all dentistry advanced graduate programs in Brazil⁴.

Although these regulations are helpful and motivate the universities/educational institutions to increase the quality of services and seek supremacy, they are very general and broad regulations. Therefore, these regulations sometimes lack details and accuracy of requirements for each of the diverse areas where graduate programs are located. In other words, depending on the region where the university/educational institution is based, it will be more or less difficult for the graduation program to reach the expected and required government regulations, because of the differences in social-

economic-political and economic context between areas. The higher per-capita income areas may favor a concentration of qualified professionals – which leads to the creation, maintenance and demand of graduation programs in Endodontics. This fact occurs in Brazilian Southeast and South regions, which present the highest incomes and also the biggest numbers of post-graduation programs⁵.

The demand for specialization programs is a reality in Brazil. Specifically concerning the endodontics advanced specialty programs ('*lato sensu*' or 'diploma' or 'specialization') the structure of the course should provide students with training in different topics of endodontics⁶, such as basic knowledge in research (it is expected that the student produces an article/monograph/case report at the end of the course); surgical training (periapical surgery, crown lengthening etc.); practicing and experience in traditional methods of cleaning and shaping, as well as, contemporary approaches; humanistic patient care; communication skills; innovation in teaching-learning methods; and technological evolution.

The requirements demanded by the two regulatory bodies in the country (Ministry of Education and Federal Dental Council) intend to standardize the student's learning experience to the greatest extent possible. However, the Ministry of Education web page lacks detailed data concerning the programs, such as the address, periodicity, duration, workload, and program directors' qualification/expertise. In addition to that, the webpage is not clear if each endodontics advanced specialty program is in line with the government and dentistry regulatory bodies.

Therefore, the aim of this study was to bring together characteristics and peculiarities of all Brazilian endodontics advanced specialty program, searching for information not only in the two regulatory-agencies webpages, but also navigating on other venues.

2 METHODS

The data collection happened from August to October/2019 by one of the authors. All the postgraduation programs in Endodontics were included. The study was conducted in three phases. The first phase consisted of the online access to the Ministry of Education's website (<http://emec.mec.gov.br>). This web platform has a record of all clinical endodontic advanced programs in the country. For each program, some information is available, such as geographical location, duration (months) of the program, start date, number of hours, graduate program director's personal and professional degrees profile, number of alumni coming from the previous years, and, at last, a link connecting the graduation program with the undergraduate dentistry program. For the second phase, three pieces of information (sponsoring Institution/University; specialization program in endodontics; and location/address) about each endodontic graduate program were combined and typed on Google to find its webpage. Then, additional details were collected: number/frequency and periodicity of classes/clinics, time of in-person instruction, and the total number of faculty members and instructors. The third phase of this search consisted of recording all information in a database (EpiData) (<https://www.epidata.dk>).

Statistical analyses were conducted using IBM SPSS Statistics v.21 (IBM Corp., Armonk, NY, USA). Descriptive analysis was performed for each variable, expressing data as absolute or relative frequencies \pm standard deviations or medians with interquartile ranges.

3 RESULTS

Five hundred and five endodontics specialty graduate programs were listed on the Ministry of Education government website. We classified those programs according to their current status, active or inactive. Inactive meant

that the program currently existed but was not having any class of students at the moment of our research. Four hundred and forty-six (88.3%) programs were active and 59 (11.7%) were inactive. Regarding the duration of the program, 309 (61.2%) lasted for 24 months. The majority of the course directors were male (in 349 programs, which means 69.1%). The highest degree of qualification was a master's degree (in 228 programs, which represents 45.1%) (table 1).

From 2011 to 2015, approximately 287 new specialty graduation programs in endodontics were created. This period differentiates from the previous years, when the number of programs was less than 50 for the whole country (figure 1).

From the programs that were listed at the Ministry of Education's government website, only 117 (23.2%) provided open access information, those of which, 111 (94.8%) reported the sponsoring institution/university; 81 (69.2%) the periodicity; 59 (50.4%) the work shift for the classes; 51 (43.5%) the total number of faculty members and instructors; and 65 (58.5%) the application fees and total program investment. Those data are illustrated in figure 2.

According to graduate programs websites, most of the listed programs (106, 90.5%) were sponsored by private institutions the other 5 (4.2%) were supported by public ones. All the programs were part-time, 69 programs (65.2%) had classes (lectures/laboratorial/clinic) delivered monthly (one block per month); 4 programs (4.9%) had weekly classes; and five programs (6.2%) had fortnightly classes. Besides that, three programs had different methods to deliver classes. In 31 programs (52.5%), the work shift for the classes was morning-afternoon-evening (similar to 'crash' programs or block of classes); in 23 programs (38.9%) was only at morning-afternoon; and, in 3 programs (5.08%), the work shift was afternoon-evening.

Table 1. Data on program status, region, duration (in months), and characteristics of the program's director

Variable	South		Southeast		Midwest		North		Northeast		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
<i>Number of programs</i>	115	22.7	200	39.6	55	10.8	62	12.2	73	14.4	505	100
<i>Status</i>												
Active	99	86.1	185	92.5	49	89.1	48	77.4	65	89.0	446	88.3
Inactive	16	13.9	15	7.5	6	10.9	14	22.6	8	11.0	59	11.7
<i>Duration</i>												
Up to 18 months	2	1.7	18	9	3	5.5	5	8.1	1	1.4	29	5.7
18 months	14	12.2	14	7	11	20.0	16	25.8	5	6.8	60	11.9
19 to 23 months	16	13.9	45	22.5	10	18.2	14	22.6	8	11.0	93	18.4
24 months	76	66.1	120	60	31	56.4	25	40.3	57	78.1	309	61.2
>24 months	7	6.1	5	2.5	-	-	2	3.2	1	1.4	15	3.0
Not informed	-	-	-	-	-	-	-	-	2	2.7	2	0.4
<i>Program's director</i>												
<i>Gender</i>												
Male	83	72.2	146	73	34	61.8	41	66.1	45	61.6	349	69.1
Female	32	27.8	54	27	21	38.2	20	32.3	28	38.4	155	30.7
Not informed	-	-	-	-	-	-	1	1.6	-	-	1	0.2
<i>Qualification</i>												
Specialization	11	9.6	27	13.5	6	10.9	8	12.9	12	16.4	64	12.7
Master's	60	52.2	67	33.5	35	63.6	32	51.6	34	46.6	228	45.1
Doctorate	44	38.3	103	51.5	14	25.5	21	33.9	25	34.2	207	41.0
Post-doctoral fellow	-	-	3	1.5	-	-	-	-	2	2.7	5	1.0
Not informed	-	-	-	-	-	-	1	1.6	-	-	1	0.2

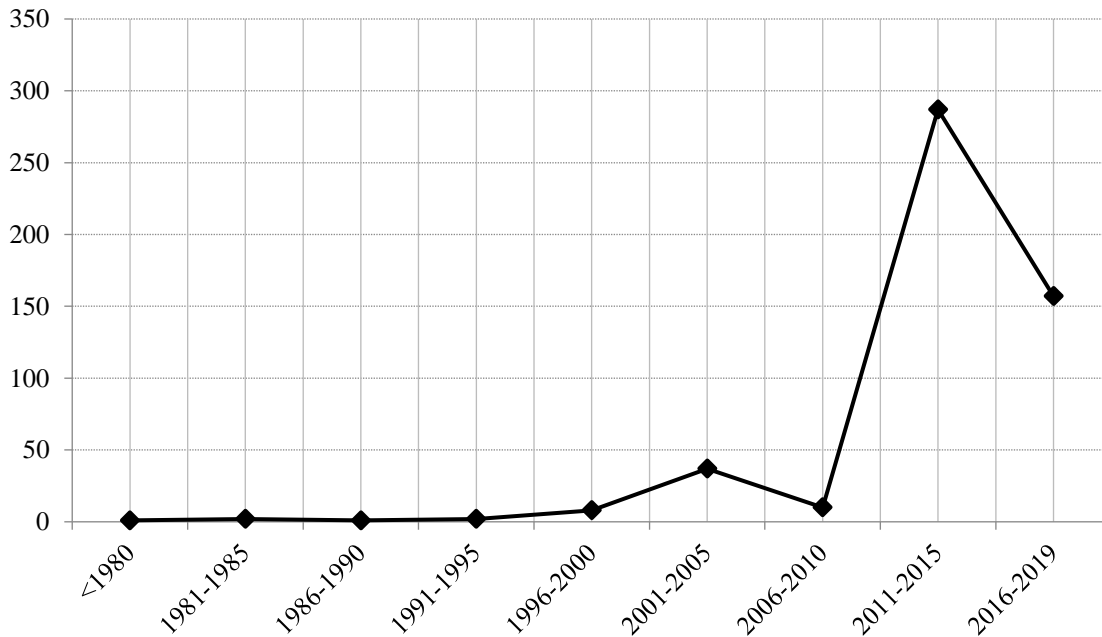


Figure 1. Number of Endodontics specialization programs registered in Brazil up to 2019, according to the Brazilian Ministry of Education website

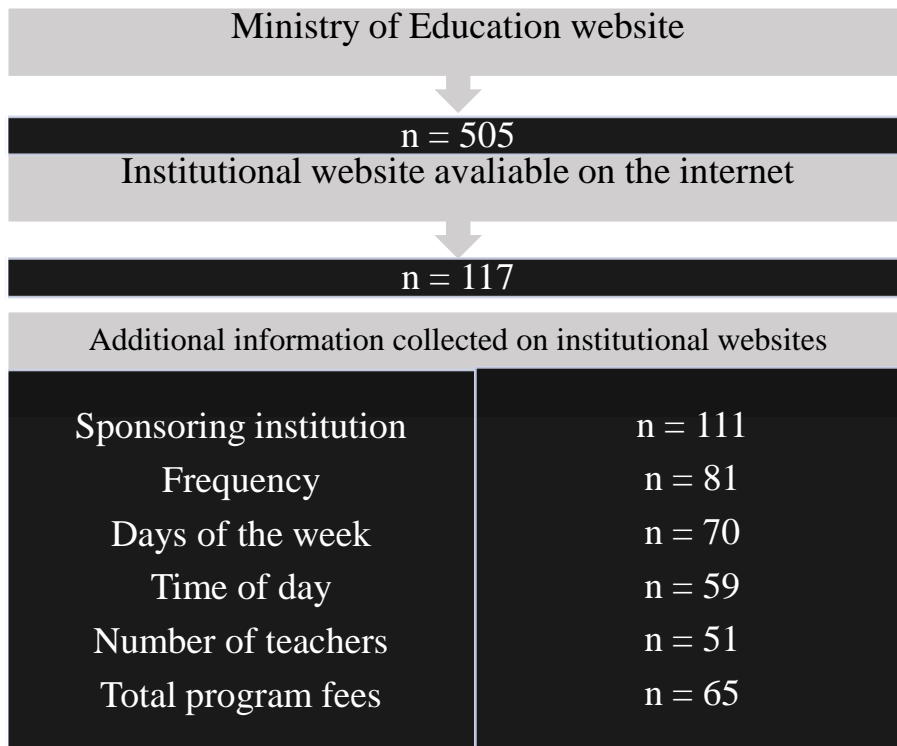


Figure 2. Flowchart of data obtained from the Brazilian Ministry of Education website and from the world wide web

The cost data, available in 65 programs, showed that the mean fees were R\$1,228.68, ranging from R\$988.90 to R\$2,600 (monthly payment). Over this investment, the graduate student still needs to afford the endodontic armamentarium and scrubs. The program's mean total cost was R\$38,588.64, ranging from R\$3,904 to R\$62,400. These values are listed in Brazilian reais.

4 DISCUSSION

This study used publicly available data to bring together specific information on Brazilian endodontic specialty programs to provide supplemental knowledge for future candidates/students and assess programs' characteristics and geographic distribution.

All specialization programs should be registered on the Ministry of Education' government website, and available for

consultation. However, we noticed that some of the information available from this electronic site was inconsistent, since it was not always possible to isolate the specific details of each course. This prompted us to conduct additional investigations using the names of each course, as registered with the Ministry of Education' government website, together with the cities where they are based, and the term "specialization in endodontics". The intention was to locate the websites of the sponsoring institutions to obtain information on the types of programs offered, the activities schedule, fees, and other information relevant to the study and had been defined in advance by the researchers. Using this research method proved possible to compile all of the available information and certain additional data from the institutions' own websites.

One limitation encountered during this study was the absence of web addresses for the programs, since there is no obligation/requirement in this

regard. This is clearly illustrated in figure 2. At the start of data collection, 505 institutions were identified as registered with the Ministry of Education' government website – which was the starting point for the results shown in table 1. However, the data reduced considerably when attempts were made to identify websites, resulting in a sample of 117 programs that had specific websites. For example, the information regarding “*work shift for classes/clinics and periodicity of classes*”, was incomplete or even unavailable in many cases. Some programs' websites reported that this information would be provided for the students seeking a degree in endodontics by requesting. For this, an administrative email was provided at the webpage. Considering the diversity and plurality of the distribution, supply, and specific characteristics of the courses, the method employed to locate information proved satisfactory, since it was possible to acquire the basic (and relevant) data on all registered programs in all the five Brazilian administrative regions, in addition to more specific information, which also contributes to providing an overview of Endodontics specialization programs available in Brazil. Direct contact with the programs may be necessary for a more comprehensive data collection in future studies.

Analysis of the records of registered programs gave the impression that a large number of the available programs were gradually expanded over the years. However, this is not the true picture. It was evident that a considerable increase in the number of programs occurred from 2010 onwards. Up to that point, only 61 endodontics specialty programs were registered, which accounts for 12% of the total number registered currently. A further 444 new programs were registered after that point, which is a very perceptible amount.

The great increase in the number of programs may be a result of policies that began to be implemented in the mid-1990s, encouraging this

trend. Several specialization programs were implemented in the private sector. Additionally, another contributing factor in the growth of the number of programs is an absence of standards and of clear criteria for assessment of these courses. The Brazilian national plan for postgraduate education for the years 2011-2020 contains a concise, well-structured, and organized plan for evaluation of *stricto sensu* courses, but there is an evident lack of planning for *lato sensu*'specialty' programs⁷.

Specialty programs are an essential element in training a workforce capable of meeting the population's needs in general. American Dental Association data show around 5,700 endodontist specialists in the United States. This number is growing, but at a slow pace. In 2002, the country had 4000 professionals in this area. According to Johns et al. (2006), this is because the workforce is regulated by the rules of supply and demand, balancing the market⁸. In Brazil, there are more than 17,000 endodontists, according to the Federal Dental Council⁹.

Brazil is one of the most populous countries in the world, with around 210 million inhabitants, according to projections published by the Brazilian Institute of Geography and Statistics¹⁰. According to the World Health Organization (WHO), 37% of WHO member countries report fewer than 1 dentist for each 10 thousand people¹¹. The WHO data show that Brazil has around 12 dentists for every 10 thousand inhabitants, making the country one of the largest dental workforce globally, with more than 340 thousand dentists^{11,12}. Based on this, considering the large number of generalist dental professionals and the increasing patient demand for specialized services, there is evidently a need for training and professional specialization courses. This demand should be met by public and private institutions the ones that should offer optimal advanced education programs.

In the present study, it was observed that the

majority of endodontic graduate programs were concentrated in the private sector (95% of registrations). The current belief is that the number of private graduate programs will increase, because of the current law-regulations (Resolution No. 1 of April 6, 2018)³, that have removed the obligation for graduate programs being sponsored by higher education institutions (for example: public and private universities) or *stricto sensu* postgraduate institutions (the ones that provide only MSc and PhD programs, but not 'specialty/diploma' programs)³.

There is no consensus regarding the expertise/qualifications of the endodontic graduate program directors (as well as the program's instructors) between the Ministry of Education and the Federal Dental Council. For the Federal Dental Council Resolution (2005), "*the course director must have at least a Masters' degree in the area of Dentistry and the remaining staff must include at least two dental surgeons who must also have, at least, a Masters' degree in their specialty – or a related area – and at least one dental surgeon who is a specialist in the area*". Additionally, all staff responsible for the course must be board-certified⁴. The Masters' degree is not a mandatory criterion for the Ministry of Education, which recommends that all graduate programs instructors must be composed of qualified professionals (with *stricto sensu* degrees), with a minimum of 30% of specialists in the area (endodontics). Overall, these requirements are similar to those for North-American programs, where the program director must be a board-certified specialist, but must also be a full-time faculty member and must spend at least 24 hours per week teaching Endodontics¹³. When assessing the Brazilian Federal Dental Council requirements, we observe that the most prevalent qualification is a Masters' degree, at 45.2% (228), showing compliance with the Council's requirements. However, 12.7% of the programs (64) have a course director who only has

a specialist degree (equivalent to a postgraduate certificate or diploma). Therefore, these programs have a chance of not being approved by the Federal Dental Council. However, credential approval is gained in some cases, considering those programs' high standards in other aspects.

In this study, it was also observed that the majority of programs had male directors, accounting for 69.1 % (349). This finding should be considered in the context of the overall situation in Brazilian dentistry. Federal Dental Council records show that around 60% of the more than 300 thousand dental surgeons practicing in Brazil are women⁹. These data are conflicting, since the percentage of women who graduated in Dentistry increased from 25% in 1970 to 53% at the turn of the century. The lower proportion of female directors of Endodontic specialization programs may be related to the fact that until the last two decades dentistry was predominantly a male profession¹⁴. The constant sociocultural changes in Brazil have contributed to an active role for women in Dentistry. However, there are still opportunities for greater inclusion since numerical equality does not always represent gender equality in terms of equal occupation of leading roles, so segments remain in which female participation is not yet equal, as in the case of directorships¹⁵. The present dental endodontic literature does not explore the repercussion of woman's absence as program's directors; however, in this relation has already begun to be studied. According to Plank-Bazinet *et al.* (2017), women in leadership positions can pave the way and make higher positions more attractive to female academics. This absence could discourage younger woman to pursuit these positions in the present scenario¹⁶.

The workload hours required for specialization programs in Dentistry vary depending on the specialty involved. According to regulations (article 164, of Federal Dental Council Resolution 64 of 2005), Endodontics specialty

programs need a minimum of 750-course hours. The practical component should account for around 85% of the total hours, while theoretical classes should account for around 15%⁴. For the Ministry of Education, the minimum required number of hours is 360³, which explains the existence of registered programs with fewer than 750 hours. In the present study, 12% (61) of the programs had a lower number of hours than the Federal Dental Council recommended. In order to the workload information be fulfilled, it would be ideal that regulatory authorities supervised the courses, ensuring compliance with the required recommendations.

Concerning the situation in other countries, it is observed that norms are set out in documents in a simpler and more objective manner. In the United States, specialization programs are regulated by American Dental Association guidelines¹³. In European countries, the European Society of Endodontology (ESE) is responsible for setting the parameters that must be complied with on the continent¹⁷. When comparing the numbers of hours required in other countries, we can see that Brazil requires fewer hours. The European Society of Endodontics requires that a student seeking to become a specialist in this area must study full time for three years, with a total of 4,500 study hours. This time should be shared between clinical experience (60%), academic activities (25%), and research (15%)¹⁷.

The American Association of Endodontists (AAE) and ESE both specify that the endodontist must recognize endodontic conditions, understand the best treatment evidence, plan and systematically manage pulp disorders, and have complete knowledge of tooth anatomy, among other objectives^{13,17}. From the data analysis, it is understood that course structures must take into account the local context and not just the hours recommended in other countries. After graduation, the student must be able to offer treatments meeting

the highest technical and scientific standards.

There is a lack of detailed information on many programs and, sometimes, the available information is dated. To overcome this shortcoming from the government websites, an idea for the graduate programs would be the inclusion of all specifics in their webpage, including previous statistics about relevant topics such as the number of alumni, alumni's and current students' perceptions, name and web address of all instructors, infrastructure details, monthly/year fees, expectations for candidates etc.). These actions would lead to a more transparent process to enroll in the program and facilitate the student's decision to apply to the institution's program.

5 CONCLUSION

It can be concluded that there are several Endodontics specialization programs in Brazil and that they are varied in relation to their characteristics (periodicity, length, workload etc.) and geographic distribution. This diversity of graduate programs helps reach a broad number of students' profiles. Furthermore, the different periodicities offered by the programs also benefit several students, due to the possibilities to reconcile the study's routine with clinical jobs.

RESUMO

Cursos de especialização em endodontia no Brasil: características e distribuição

Sabe-se da existência de diversos cursos de especialização em Endodontia no Brasil. Porém, não havia informações precisas acerca da distribuição geográfica, duração, carga horária e perfil dos diretores dos cursos. Também não havia formas de determinar se as exigências definidas pelos órgãos legais do país estavam sendo cumpridas. O presente estudo transversal foi conduzido para reunir características e peculiaridades de todos os cursos de especialização em Endodontia no Brasil, buscando informações nos *sites* das agências reguladoras e em outras fontes. Buscou-se o *site*

do Ministério de Educação para encontrar informações quanto à localização geográfica, duração (em meses), número de horas e perfil profissional do(a) coordenador(a) do curso. Os *sites* dos cursos foram pesquisados para coleta de informações adicionais – frequência, periodicidade, custos, número de professores. As buscas ocorreram entre agosto e outubro de 2019, identificando 505 cursos registrados e 117 *sites* específicos desses cursos. Observou-se que 39% dos cursos localizam-se na região Sudeste e 61,2% têm uma duração de 24 meses. Ainda, a maioria dos coordenadores são do sexo masculino, somando 69,1% da amostra. A maior qualificação entre eles foi o título de Mestre (45,1%). Em relação aos 117 cursos que possuíam *sites* específicos, as informações apresentadas foram insuficientes: a frequência foi informada apenas em 81 programas/*sites*, o número de professores apenas em 51 e o total de mensalidades apenas em 65. Conclui-se que há uma grande quantidade de cursos de Endodontia no Brasil, beneficiando os diferentes perfis dos estudantes. Ainda, há uma falta de informação clara sobre alguns cursos.

Descritores: Endodontia. Programas de Pós-graduação em Saúde. Especialização.

REFERENCES

1. Casas ALL, Guevara AJ H, Merighi CC. Avaliação de serviços em instituições de ensino superior para o desenvolvimento local. *Interações (Campo Grande)*. 2013;14:11-24.
2. Nazarova E, Martin-Peele M, Fifield J. U.S. Dental specialty residents' expectations and anticipated benefits of academic employment. *J Dent Educ*. 2016;80(10):1196-204.
3. Ministério da Educação. Resolução nº 1, de 6 de abril de 2018. [Cited Nov. 6, 2019]. Available from: http://portal.mec.gov.br/index.php?option=com_docman&view=download&alias=103631-rces004-18&category_slug=dezembro-2018-pdf&Itemid=30192.
4. Conselho Federal de Odontologia. Consolidação para normas nos conselhos de Odontologia. Published online 2012. [Cited Apr. 17, 2019]. Available from: <http://transparencia.cfo.org.br/wp-content/uploads/2018/03/consolidacao.pdf>.
5. Cirani CBS, Campanario MA. A evolução do ensino da pós-graduação senso estrito no Brasil: análise exploratória e proposições para pesquisa. *Avaliação (Campinas)*. 2015;20(1):163-87
6. Blacher JD, Safavi KE, Aseltine RH, Kaufman BM. Defining endodontic residents' clinical experiences: a national survey. *J Dent Educ*. 2019; 83(5):504-9.
7. Brasil. Ministério da Educação. Coordenação de Aperfeiçoamento de Pessoal de Nível Superior. Plano Nacional de Pós-Graduação (PNPG), 2011-2020. CAPES; 2010. [Cited Apr. 17, 2019]. Available from: <https://www.gov.br/capes/pt-br/acesso-a-informacao/institucional/plano-nacional-de-pos-graduacao>.
8. Johns BA, Brown LJ, Nash KD, Warren M. The endodontic workforce. *J Endod*. 2006;32(9):838-46.
9. Conselho Federal de Odontologia. Quantidade geral de cirurgiões-dentistas especialistas. 2020. [Cited Aug. 20, 2020]. Available from: <https://website.cfo.org.br/estatisticas/quantidade-geral-de-cirurgioes-dentistas-especialistas/>.
10. Instituto Brasileiro de Geografia e Estatística. IBGE | Projeção da população. 2020. [Cited Aug. 19, 2020]. Available from: <https://www.ibge.gov.br/apps/populacao/projecao/>.
11. World Health Organization. The Global Health Observatory. 2020. [Cited Aug. 19, 2020]. Available from: <https://www.who.int/data/maternal-newborn-child-adolescent/monitor>.
12. Conselho Federal de Odontologia. Quantidade Geral de Profissionais e Entidades Ativas. 2020. [Cited Aug. 19, 2020]. Available from: <https://website.cfo.org.br/>

[estatisticas/quantidade-geral-de-entidades-e-profissionais-ativos/](#).

13. American Dental Association. Accreditation Standards for Advanced Specialty Education Programs in Endodontics. 2018. [Cited Nov. 4, 2019]. Available from: https://www.ada.org/~media/CODA/Files/2018_endo.pdf?la=en.
14. Costa SM, Durães SJA, Abreu MHNG. Feminização do curso de odontologia da Universidade Estadual de Montes Claros. Ciênc Saúde Colet. 2010;15:1865-73.
15. Guedes MC. O contingente feminino de nível universitário nos últimos trinta anos do século XX: a reversão de um quadro desigual. Anais. XIV Encontro Nacional de Estudos Populacionais. ABEP. Caxambú-MG. 2004:1.
16. Plank-Bazinet JL, Heggeness ML, Lund PK, Clayton JA. Women's careers in biomedical sciences: implications for the economy, scientific discovery, and women's health. J Womens Health. 2017;26(5):525-9.
17. European Society of Endodontology. Accreditation of postgraduate speciality training programmes in Endodontology. Minimum criteria for training Specialists in Endodontology within Europe. Int Endod J. 2010;43(9):725-37.

Correspondence to:

Prof. Dr. Francisco Montagner
e-mail: francisco.montagner@ufrgs.br
Universidade Federal do Rio Grande do Sul
Faculdade de Odontologia
Rua Ramiro Barcellos, 2492
Santana
90035-003 Porto Alegre/RS - Brazil