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LITERATURE REVIEW

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Gerodontology as a dental specialty in Brazil: What has been accomplished after 15 years?

Odontogeriatria como especialidade odontológica no Brasil: o que alcançamos após 15 anos?

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ABSTRACT

Fifteen years ago, as a response to its rapidly aging population, Brazil was the first country to recognize gerodontology as a dental specialty. The aim of this paper is to evaluate the outcomes of this change by examiningthe increase in number of advanced gerodontology-trained dentists and identifying the volume of gerodontology-related research that has been published. The Brazilian Dental Board web site was searched in order to verify the number of specialists in gerodontology and their geographic distribution. In order to provide a quantitative assessment of the number of gerodontology-related graduate programs generated since the specialty was recognized, three sites were searched: a) the government database for post-graduate theses, which compiles all theses and dissertations completed as part of the requirements of accredited post-graduate courses in Brazil; b) the Brazilian Dental Library (Biblioteca Brasileira de Odontologia, BBO), which compiles papers published in Portuguese; and c) the PubMed database.Recognizing gerodontology as a dental specialty in Brazil required advanced training programs to be developed in geriatrics and gerodontology. The current number of specialists in gerodontology(276) is still lower than the needs of the Brazilian dental work force.Recognition of the specialty seems to have resulted in a significant increase in gerodontology-related research;however,this growth coincides with an overall increase inresearch in Brazil and is less extensive than forother specialties,which were recognized at the same time. More still needs to be done to add gerodontology to dental school curricula, even though a significant number of schools do teach the discipline.

KEYWORDS

Dental Education; Geriatric Dentistry; Gerodontology.

RESUMO

Como resposta ao rápido envelhecimento da população brasileira, o Brasil foi o primeiro país a reconhecer a odontogeriatria como especialidade odontológica. O objetivo do presente trabalho é apresentar os resultados obtidos pelo reconhecimento quanto ao número de dentistas especializados em odontogeriatria e na publicação científica na área. Buscas foram realizadas no site do Conselho Federal de Odontologia (CFO) quanto ao número de profissionais e sua localização geográfica. Para verificar a quantidade de publicações na área, buscas foram realizadas em três sites: a) o banco de teses mantido pela Capes; b) a Biblioteca Brasileira de Odontologia – BBO; e c) o site do Pubmed. Quinze anos de reconhecimento da odontogeriatria como especialidade no Brasil proporcionaram a formação de especialistas na área, embora o número atual (276) esteja aquém das necessidades do país. Adicionalmente, o reconhecimento da especialidade parece ter propiciado um aumento significativo na produção científica relacionada à odontogeriatria, embora esse conhecimento coincida com um aumento generalizado da produção científica brasileira no mesmo período. Muito mais precisa ser feito em relação à participação da odontogeriatria nos currículos das faculdades de Odontologia, embora um número significativo de faculdades ensine essa matéria.

PALAVRAS-CHAVE

Educação em Odontologia; Odontogeriatria; Odontologia geriátrica.

INTRODUCTION

The 2000 Brazilian Census indicated a rapidly aging population. At that time, Brazil had 14.5 million individuals 60 years and older, or 8.6% of the population.Currently,the elderly population in Brazil is 24.7 million (12.1%) [1].In order to prepare the Brazilian dental work force for the challenge posed by the aging of the population, the Brazilian Dental Board (Conselho Federal de Odontologia, CFO) decided to recognize gerodontology as a dental specialty in 2001. Brazil became the first country in the world to recognize gerodontology as a dental specialty[2].

Several other countries also have recognized a need for more training in gerodontology[3-8]. However, these countries have met this challenge in different ways. Some programs have added gerodontology to their pre-doctoral curriculum, while others have added it to their continuing education courses[7-10], and a few have added it as a post-graduate program[2].

In early 2002, the Brazilian Dental Board [11]established a gerodontology action plan: a) to study the impact of social and demographic factors on the oral health of the elderly; b) to study the aging of the masticatory system and its consequences; c) to study diagnosis and treatment of oral pathologies in elderly patients, including the side effects of drug and irradiation therapies; and d)to study the influence of comprehensive multidisciplinary planning and provision of oral health care for geriatric patients.

Various positive outcomes were envisioned by recognizing gerodontology as a specialty. The primary positive outcome would bean increase in the number of highly trained dentists with specific skills in gerodontology and geriatrics to assist in the treatment of the growing elderly Brazilian population. Another positive outcome would bean increase in teaching gerodontology in the undergraduate dental school curricula,thus future generations of dentists would have the skills to care for frail elderly individuals in their communities. Incorporating gerodontology into the dental schools curricula would also create a need for trained faculty. In the Brazilian academic system, all faculty members are expected to work in all three branches of university life: teaching, research, and service (including patient care). This would result in more faculty members being involved in teaching gerodontology, which could potentially increase research in this field.

The theoretical benefit of recognizing gerodontology as especialty can be easily verified: fifteen years have passed, and the elderly population in Brazil has grown to more than 24.7 million (12.1% of the total population) [1].Other changes have also occurred in the Brazilian health system [12], such the expansion of the universal health system incorporating community-based health care teams, however. these changes have important repercussions which have impacted Brazilian dental schools [13].This paper evaluates the question; what effect did recognizing gerodontology as a specialty have in improving the teaching, research and oral health care of the Brazilian aging population?

Data sources

The web site of the Brazilian Dental Board [11] was used as primary source of information for the number and distribution of specialists in gerodontology around the country. In order to provide a quantitative assessment of gerodontology-related literature generated since the specialty was recognized, we searched three sites: a) the government database for post-graduate theses (http://bancodeteses.capes.gov.br), which compiles all theses and dissertations done as part of the requirements of accredited postgraduate courses in Brazil; b) the Brazilian Dental Library (Biblioteca Brasileira de Odontologia, BBO), which compiles papers

published in Portuguese; and c) the PubMed database. All searches were conducted in October 2015, and keywords used were "elderly or aging" and "oral health or dentistry or dental" and their respective translations in Portuguese. When searching the PubMed database, the word "Brazil" was added. Retrieved titles were read, and unrelated results or duplicates were manually removed. The retrieved article titles were added to a single text file and used to generate tag clouds using Wordle (www.wordle.net). The tag clouds present the findings in an interesting visual way:the larger the word appears in the tag cloud, the higher the number of appearances of that word in the text.

Number of dentists highly trained in gerodontology

During the first year the specialty was recognized, 89 dentists were grandfathered into the specialty by presenting proof of previous post-graduate studies or experience in teaching and/or practicing geriatric dentistry. These petitions were evaluated by a board of experts, assigned by the Brazilian Dental Board (CFO).

After thatfirst year, candidates had to complete a post-graduate course to be registered as a specialist in gerodontology. These courses required a minimum of 750 h, with at least 600h dedicated to clinical experiences and 150 h of didactic courses. This minimum of 750h of gerodontology-specific content did not includean additional 105h of mandatory courses in jurisprudence, scientific methodology, and bioethics, as well asa final written assignment (dissertation). An example of a course syllabusis presented in Table 1.

Although the Brazilian specialization courses are not as intensive as a two-year full-time residency program or even a one-year full-time certificate program in the USA, they might be considered advanced training in gerodontology programs. There is no masters degree program in gerodontology in Brazil, which would usually require two years of full-time training.

Table 1 - Example of gerodontology specialty course syllabus contents summary

Subjects	Lecture hours	Clinic hours	Total hours
Gerodontology core contents			
Aging oral presentations	20	-	20
Treatment planning for the elderly	40	-	40
Drug therapy for the elderly	10	-	10
Home care and alternative settings	10	-	10
Interdisciplinary approach for elderly dental treatment	10	-	10
Geriatric dentistry clinic and home care rotation	-	600	600
Gerontology-related contents			
Current aging demography	12	-	12
Age-related metabolic changes	12	-	12
Common diseases among the elderly	10	-	10
Nutritional changes among the elderly	10	-	10
Medical emergencies	20	-	20
Mandatory courses			
Jurisprudence	30	-	30
Scientific methodology	60	-	60
Bioethics	15	-	15
Total hours	**259**	**600**	**859**

One hundred eighty-seven dentists successfully graduated from these specialty courses, so the total number of gerodontology specialists in Brazil as of December 1, 2015 was 276. Figure 1 presents the distribution of these specialists throughout Brazil[11].



Figure 1 - Brazilian map distribution of gerodontology specialists.

In 2007, Hebling et al.[14] reported that 124 specialists in gerodontology were distributed around the country, with a higher concentration in the southeast and southern regions. Their results were very similar to our findings, although these searches were done 10 years apart.

It is important to note that Brazil has a universal health systempaid for by public funds, whose goal is to provide equal health benefits for all Brazilians. In oral health, many accomplishments have been achieved by the Brazilian health system, but the unequal distribution of the dental work force remains an important problem [12]. The unequal distribution of specialists in gerodontology follows this national trend.

The total number of specialists in gerodontology in Brazil is extremely low in comparison to other specialties which were recognized at the same time,such as "maxillofacial orthopedics", which has1,803 specialists, and "orofacial pain and temporomandibular disorders" with 1,151 specialists[11].

The Brazilian gerodontology services do not look any better than the ones observed in other countries that have not recognized gerodontology as a dental specialty. The number of dentists graduating from training programs in geriatric dentistry funded by different agencies in the USA from 1979 to 2014 has been estimated at 163[2]. In Europe, the opportunities for advanced training programs in gerodontology are limited, although a precise number of trained dentists is not available [6]. In Japan, there is no masters or certificate program in gerodontology, and the only available training program is a four-year PhD course[8].

It is difficult to compare the numbers of advanced gerodontology-trained dentists from different countries due to the heterogeneity of each country'scourse requirements, but it is evident that advanced training opportunities are not easily available in most countries.This lack of training programs has been suggested to be a leading cause for the shortage of adequately trained professionals to provide care for aging populations[6,14].

In Brazil, however, many of the specialty courses in gerodontology are not being taught simply because there are no interested applicants. It is also a concern in other countries that the small number of courses reflects the lack of interest from dentists in caring for frail older adults[2]. Brazil is no different, 55.6% of Brazilian senior dental students reported they have little or no interest in working with elderly patients [15], and 73.4% of interviewed Brazilian dentists do not treat elderly patients in their practices [16].

An initial hope amongst those Brazilians who were interested in gerodontology was that if it were recognized as a dental specialty, gerodontology would be integrated into the dental school curriculum. These dental school programs would prepare general practitioners

to deliver more appropriate care to community-dwelling older adults who are functionally independent as well as those persons who are frailer but are still receiving their dental care in a general dental practice. These two groups of elderly people account for approximately 90% of the elderly population [17]. The patients seeking specialists in gerodontology would include those from these two groups, but theoretically they should be more focused on the functionally dependent older adults who are homebound (5%) or living in nursing homes (5%).

Research completed a decade ago[15] reported that Brazilian dental schools had only partially incorporated gerodontology into their curricula. About a third of the dental schools had incorporated gerodontology either as a separate course or as part of an existing course. More recently [16], 81.2% of the interviewed dentists in the state of Minas Gerais reported they had not received any kind of gerodontology courses.

In an ongoing effort to change the dental school curriculum to better fit the needs of the Brazilian health system, there has been a shiftfrom the private practice model to a community-based modelin caring for the elderly population. Unfortunately, it did not help to add requirements for more gerodontology training in dental schools [13]. The recognition of gerodontology as a dental specialty alone was not enough to trigger more undergraduate teaching in gerodontology, as a 2015 study [18] found the number of dental schools teaching gerodontology as a stand-alone course was about only 13 out of 220 (6%).

Currently, 61 Brazilian dental schools are estimated to have mandatory stand-alone gerodontology courses.

Many other countries are doing much better. In the US, all dental schools provide their dental students with some training in gerodontology, which is part of the training in most general practice residencies and advanced education in general dentistry programs. However, only 22.6% of dental schools offer clinical training in geriatric dental care, and only 23% of dental schools provide continuing education courses in gerodontology[2,7].

In Europe, different countries have presented different experiences with undergraduate education in gerodontology[9,19], but the majority provide some training in this topic for dental students. Thirty-six percentof European dental schoolsoffer gerodontology as a specific course, but only 18% have a specific gerodontology clinic. Undergraduate curriculum guidelines were established in 2009 [10].

Japan hosts the world's most aged society, and has had a national gerodontology society since 1986;its first gerodontology department was established in a dental school in 1987. About a third of Japanese dental schools have a department of gerodontology, andthose that lack a such a department teach gerodontology through their prosthodontic departments[8]. For comparison, Brazil still lacks a gerodontology society (it had a short-lived one, as well as an equally short-lived gerodontology-based journal in Portuguese). Only a few Brazilian dental schools offer gerodontology as a specific course, and none have a department of gerodontology.

Research activity in gerodontology

Another potentialpositive outcome of recognizing the specialty of gerodontology was that it might trigger anincreasing awareness about oral problems of the elderly population and stimulate more faculty members to conduct research on the oral problems of the older population.

At least 30 years ago, American research agencies (theNational Institute on Aging, the National Institute of Dental Research now the National Institute of Dento-Cranial Research. and the Veterans Administration) developed a research agenda for elderly oral health. This agenda identified a lack of epidemiological data regarding elderly oral needs or studies designed

to bring a better understanding of elderly-related oral problems such as, tooth erosion and abrasion, root caries, communication with people with dementia, among others. Although these issues are very important and awareness was raised years ago, many of these issues remainas problems today[2].

In Brazil, there was no strategic planning regarding the research needed to improve the oral health care of the elderly, and this issue was left up to researchers asking for funds on an on-demand basis. In order to provide a quantitative assessment of the literature generated since recognition of the specialty, we searched three sites as reported in the Material and Methods.

The search of the government database for post-graduate courses final theses resulted in 75 thesesand dissertations. The distribution of these scholarly works throughout the country is displayed in Figure 2. All retrieved dissertation titles were added to a single text file, the aforementioned keywords were removed, the remaining text was translated using Google Translate, and tag clouds were generated using Wordle. The thesestitle tag cloud is shown in Figure 3. The most common words were association, population, quality, community, care, life, evaluation, assessment, epidemiological, and Brazil. They denote a lot of concern with associations of oral health and other factors, as well as the epidemiological approach.

Searching the BBO database yielded 115 articles, and the tag cloud generated by the titles is presented in Figure 4.We also removed the words “patient” and “patients” from the text, as they were usually associated with the word “elderly.” The words cited most often were treatment, people, population, age, care, and conditions. These words revealed concerns about dental treatment, oral health conditions, and epidemiological aspects of gerodontology.

Searchingthe PubMed database yielded a total of 178 articles, a higher number than the BBO database, which might be seen as a consequence of the push from Brazilian agencies to have Brazilian researchers publishing in international journals. The tag cloud for the PubMed titles can be seen in Figure 5. The words most often cited were associated, older, quality, factors, patients, population, and institutionalized. These words brings a new item to the ones previously mentioned: the oral health of the institutionalized elderly. It is worth noting that Brazil had published only 3 articles indexed in PubMed before the year 2001.



Figure 2 - Brazilian map distribution of gerodontology-related theses.



Figure 3 - Gerodontology-related theses titles tag cloud.



Figure 4 - Brazilian Dental Library (BBO) database articles titles tag cloud.



Figure 5 - PubMed database articles titles tag cloud.

Although the final figure of 178 articles looks impressive, when one considers the 15-year time span, it averages at one article per month for a country with 220 dental schools. During this same time span,there was also a quantitative boom in Brazilian research, when Brazilian papers indexed in Web of Science increased three-fold in 20 years [20], enhanced by the last decade of economic growth. How much of this quantitative increment is considered a qualitative advance for Brazilian dentistry is the subject of much debate.

When compared to other specialties, such as "temporomandibular disorders and orofacial pain", scholarship in gerodontology is lagging far behind. The "Temporomandibular disorders and orofacial pain" specialtyhas published 731 theses and 576 PubMed-indexed articles [21]. However, these numbers also include articles from Brazilian authors working in other countries, and the results presented in this paper counted only articles published from Brazilian universities.

CONCLUSION

Fifteen years have passed since the recognition of gerodontology as a dental specialty in Brazil and the establishmentof advanced training in geriatrics and gerodontology for Brazilian dentists. However, the current number of 276 specialists is still well below the needs of the Brazilian dental workforce. In addition, recognizing the specialty seems to have triggered a significant increase in research in gerodontology. This increase coincides with an overall increasein research in Brazil but is less impressive when compared to other specialties,which were recognized at the same time. Much more still needs to be done to incorporate gerodontology into dental school curricula.

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