Profile of Brazilian scientific research in pediatric dentistry based on the 26th Annual Meeting of the SBPqO

Perfil da produção científica brasileira na Odontopediatria baseado na 26ª Reunião da SBPqO

Abstract

Purpose: To describe the Brazilian scientific research in pediatric dentistry in 2009 based on the 26th Annual Meeting of the SBPqO (Brazilian division of the IADR).

Methods: All studies on pediatric dentistry were selected from the abstracts presented at the 26th Annual Meeting of the SBPqO in 2009. They were assessed in terms of subjects, methodology and sampling units.

Results: Of the 2,648 abstracts presented, 7.7% were on pediatric dentistry, thereby representing the field with the 4th greatest participation in the meeting. The Southeast was the most productive region in Brazil, accounting for 70.1% of abstracts. A wide range of subjects were addressed: dental trauma (5.4%), diagnosis of dental caries (4.9%), diet and dental caries (4.4%), endodontic medication (4.4%), developmental enamel defects (3.4%), glass ionomer cement (3.4%), and dental care for pregnant women (3.4%). The cross-sectional design was the most prevalent type of study (52.5%), followed by *in vitro* studies (23.5%). Only 2.5% of the abstracts were randomized controlled trials. A total of 41.7% of the studies included children aged 0 to 11 years old, while 14.7% used human deciduous teeth.

Conclusion: Pediatric dentistry played an important role in Brazilian scientific research in 2009, presenting a broad diversity of subjects and methodological approaches.

Key words: Pediatric dentistry; dental research; bibliometrics

Resumo

Objetivo: Descrever a produção científica brasileira na Odontopediatria em 2009, baseando-se na 26ª Reunião Anual da SBPqO (divisão brasileira do IADR).

Metodologia: Todos os estudos na área de Odontopediatria, selecionados a partir dos resumos apresentados na reunião, foram avaliados em termos de assuntos, desenho metodológico e unidades amostrais.

Resultados: Dos 2648 resumos apresentados, 7,7% corresponderam aos de Odontopediatria, representando a área com a quarta maior participação. A região sudeste foi a mais produtiva do país, sendo responsável por 70,1% dos resumos. Foram abordados assuntos bastante variados, sendo os mais prevalentes: traumatismo dentário (5,4%), diagnóstico de cárie dentária (4,9%), dieta e cárie dentária (4,4%), medicações endodônticas (4,4%), defeitos de desenvolvimento de esmalte (3,4%), cimento de ionômero de vidro (3,4%) e atendimento odontológico para gestantes (3,4%). Os estudos transversais foram os mais prevalentes (52,5%), seguidos dos estudos *in vitro* (23,5%). Apenas 2,5% dos resumos foram estudos clínicos controlados e randomizados. Um total de 41,7% incluíram crianças de 0 a 11 anos de idade e 14,7% utilizaram dentes decíduos humanos.

Conclusão: A Odontopediatria desempenhou um papel importante na produção científica brasileira em 2009, oferecendo uma ampla diversidade de temas e abordagens metodológicas.

Palavras-chave: Odontopediatria; pesquisa odontológica; bibliometria

Imara de Almeida Castro Morosini [a]
Wanessa Bueno Otto [a]
Vera Lúcia Carneiro [a]
Louise Liu Rigo Vargas de Oliveira [a]
Diego Canavese de Oliveira [a]
Fernanda de Morais Ferreira [a]

[a] Department of Stomatology, School of Dentistry, Universidade Federal do Paraná, Curitiba, PR, Brazil

Correspondence:
Imara de Almeida Castro Morosini
Av Cândido Hartmann, 1465, Mercês
Curitiba, PR – Brasil
80710-570
E-mail: imaracastro@terra.com.br

Received: July 29, 2011
Accepted: April 11, 2012

Conflict of Interests: The authors state that there are no financial and personal conflicts of interest that could have inappropriately influenced their work.

Introduction

Dentistry has developed into a field in which scientific research is fundamental. Despite being relatively recent in comparison with the educational and scientific system in developed countries, the Brazilian dental research has increased dramatically in recent years. In 2004, Cury (1) reported that the number of articles in dentistry from Brazil indexed in Medline between 2001 and 2003 was greater than the number of such articles published during the entire 20th century. Currently, Brazil contributes with almost 1.5% of the world scientific research, and the number of Brazilian studies cited in international databases has also increased (2,3).

The annual meeting of the Brazilian Society for Dental Research [Sociedade Brasileira de Pesquisa Odontológica (SBPqO)] is the largest and the most important meeting for national researchers in Dentistry (4). The SBPqO is the Brazilian division of the International Association for Dental Research, and annual meetings have been held since 1983. The studies presented in those meetings are from all regions of the country and fields of dentistry. Therefore, these meetings may be considered as representative samples of dental research in Brazil (5).

In 1968, pediatric dentistry was recognized as a specialty in Brazil. In 1998, 69 specialization courses were offered in the country, with a total of 3,987 experts integrated into the dental care system for children and adolescents (6). According to data from the Brazilian Dentistry Council, by 2009 the number of registered experts had increased to 8,162 and 191 institutions offered a specialization course in this area. Pediatric dentistry is becoming more committed to offering patients the latest scientific advancements in dental health care by seeking useful and consistent information in the literature to guide clinical practice (7).

The research in pediatric dentistry has become very prominent in Brazil. In 2007, Amorin et al. (8) conducted a literature search analyzing the topics covered by three Brazilian journals on dentistry during a 15-year period. For this study, they selected national journals with periodic publications and recognized credibility, accessed by clinicians and specialists, and that expressed dental publications in a positive way. The five most common topics were all related to technical and professional aspects of dentistry and represented 52.7% of all studied articles. Pediatric dentistry was in 7th place, with 4.7% of all published articles. In 2008, Dias et al. (5) developed a study to describe national dental research trends in the early 21st century. The authors assessed abstracts presented at meetings of the SBPqO from 2001 to 2006. According to the Council's specialty categories, the authors found that only the following five fields had a frequency higher than 10.0%: esthetic dentistry, periodontics, endodontics, pediatric dentistry and population-based oral health.

The aim of the present study was to describe the Brazilian research in pediatric dentistry in 2009 based on the studies presented at the 26th SBPqO. The goal was to survey the most relevant topics in pediatric dentistry, identify gaps in knowledge and thereby direct further studies toward deficient areas.

Materials and Methods

This study was based on a retrospective evaluation of all abstracts published in the annals of the 26th SBPqO (n=2,648). The data were collected and analyzed by five Master's students under the supervision of a professor with a Ph.D.

All abstracts were read and categorized by the authors in alternating pairs. In the area of pediatric dentistry were included studies comprised of individuals 0 to 11 years of age or biological samples from individuals in this age group, primary or permanent young teeth, laboratory studies evaluating techniques, materials or products aimed at children, and dental care provided to pregnant women. Studies were not limit based on presentation format at the meeting. A total of 204 abstracts were selected and the inter-evaluator agreement of eligibility was 100%.

Researches on pediatric dentistry (n=204) were assessed in terms of subjects and aims, methodology and sampling unit. They were also evaluated based on the type of home institution (public, private) and geographic region of the country (south, southeast, central-west, north, northeast). To increase accuracy in data extraction, three researchers evaluated each abstract independently, and the final data were compared. If there was any disagreement between the evaluators, then the gold standard (Ph.D in pediatric dentistry) was consulted.

The information was coded to construct databases, which were analyzed using the Statistical Package for the Social Sciences (version 15.0; SPSS Inc. Chicago, IL, USA) and Microsoft Excel (Microsoft Office Excel 2007).

Results

Pediatric dentistry accounted for 204 of the 2,648 studies published in the annals of the 26th Annual Meeting of the Brazilian Society for Dental Research, placing 4th among the fields with the greatest participation (Fig. 1). Of the 204 abstracts, 126 (63.3%) were presented by postgraduate students and effective researchers and 75 (36.7%) by undergraduate students in dentistry.

Considering data from the 26th Annual Meeting of the Brazilian Society for Dental Research, in 2009 the Southeast was the most productive geographic region in Brazil in pediatric dentistry, accounting for 70.1% of all abstracts, with the state of São Paulo alone accounting for 43.6% of those. The second greatest participation came from the South, which was followed by the Northeast. The Central-West region was only represented by the state of Goiás, accounting for 1% of the studies. The Northern region also only accounted for 1% of the studies (Fig. 2). The majority of research in pediatric dentistry was carried out at public institutions (federal and state universities). Private institutions contributed less than one third and only a tiny

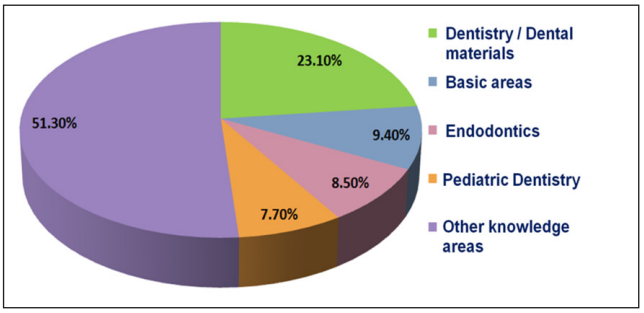

Fig. 1. Most prevalent fields at the 26th meeting of the SBPqO; Águas de Lindóia, Brazil, 2009 (n = 2,648)

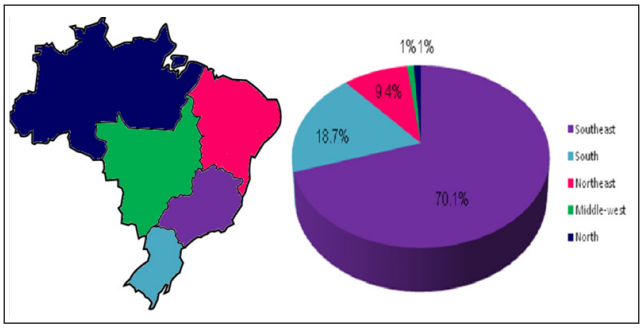

Fig. 2. Map of Brazil (A) and frequency of abstracts presented at the 26th meeting of the SBPqO based on geographic region (B); Águas de Lindóia, Brazil, 2009 (n = 204)

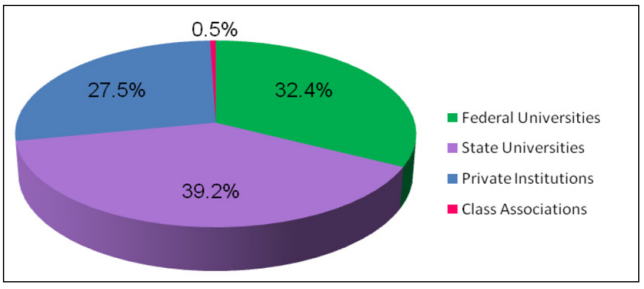

Fig. 3. Distribution of pediatric dentistry research according to type of home institution at the 26th meeting of the SBPqO; Águas de Lindóia, Brazil, 2009 (n = 204)

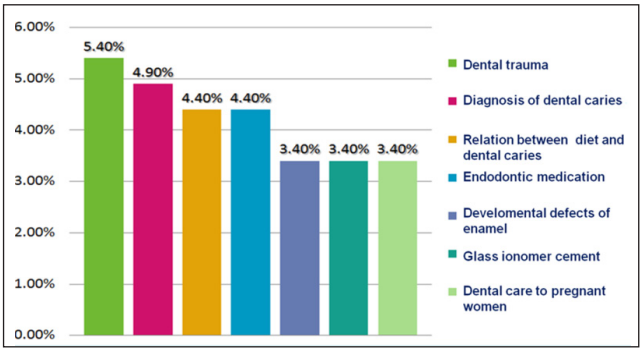

Fig. 4. Distribution of pediatric dentistry research according to most prevalent subjects at the 26th meeting of the SBPqO; Águas de Lindóia, Brazil, 2009 (n = 204).

portion of the research in pediatric dentistry was conducted by dental associations (Fig. 3).

There was a wide range of subjects among the studies. The most prevalent of these are displayed in Fig. 4. The aim of most studies (82.3%) was to associate variables and compare groups. A total of 2.5% sought to validate methods, 1.5% discussed diagnostic tests, and 1.5% sought to evaluate the consistency of data collection.

The cross-sectional design was the most prevalent type of study (52.5%), followed by *in vitro* laboratory studies (23.5%). Only 2.5% of the abstracts were randomized controlled trials. Qualitative and quality-quantitative studies represented 1.5% and 1.0% of the total, respectively. Regarding the study samples, 41.7% of the studies worked with male and female children ages 0 to 11 years, whereas 14.7% of the studies used human deciduous teeth.

Discussion

Based on the findings described, pediatric dentistry accounted for nearly 10% of the abstracts, thereby occupying the 4th position among the fields with the greatest participation at the 26th meeting of the SBPqO. In 2008, Dias et al. (5) reported a similar tendency in their assessment of studies presented at SBPqO meetings from 2001 to 2006. The authors found that abstracts from only the following five specialties had a greater than 10% representation: esthetic dentistry, periodontics, endodontics, pediatric dentistry and population-based oral health. These findings are also in agreement with the results discussed in a literature review analyzing the topics addressed in three Brazilian dental journals between 1990 and 2004 (8). The five most often addressed topics were related to technical and professional aspects and accounted for 52.73% of the analyzed studies. Pediatric dentistry was in 7th place, accounting for 4.73% of all articles (8). Despite the limitations inherent to using material from the annual meeting of the SBPqO, our results combined with the above listed studies highlight the growing importance of the participation of pediatric dentistry in national research.

Of the 204 abstracts on pediatric dentistry, more than 60% were presented by postgraduate students or effective researchers in dentistry, revealing the greater contribution by postgraduate courses at these meetings. In 2008, Scarpelli et al. (3) reported that the establishment of postgraduate courses in the second half of the 1960s marked the beginning of a vigorous scientific community in the country. In the past 15 years, Brazil has experienced a considerable increase in scientific activity, as measured by the number of scientific articles published in international dental journals. Pediatric dentistry appears to be following the same trend, which is likely a reflection of the increasing number of specialization courses, a total of 191 in 2009, in this field.

Analyzing the publications on pediatric dentistry by geographic region, the southeast accounted for more than 70% of all abstracts. With 18.7%, the second greatest participation came from the south. In 2009, Poleto and Faraco Jr. (7) obtained similar results, reporting that São

Paulo accounted for 40.5% of publications in pediatric dentistry, followed by Rio de Janeiro (16.8%) and Minas Gerais (7.5%). These data follow the same tendencies that were found when recent Brazilian dental research was analyzed based on abstracts presented at SBPqO meetings (4, 9). Other authors have also reported that the Southeastern region provided the largest number of studies at annual SBPqO meetings, 76.4% in 2003 (4) and 68.6% in 2009 (9), with São Paulo alone accounting for more than 50% of national scientific research: 59.4% in 2003 (4) and 51.5% in 2009 (9).

In 2003 and 2009, the scientific research in the Southern region was also the second most influential, followed in decreasing order by the Northeastern, Central-Western and Northern regions (4,9). For decades, there have been disparities in development between Brazilian macro-regions, which are also expressed in the regional distribution of scientific and technological resources and in the regional formation of human resources and knowledge production. Technical-scientific knowledge in Brazil is much more pronounced in the Southeastern and Southern regions and most government investments remain directed toward these regions (3). Among the 90 postgraduate programs and courses in the country, 65 (72%) are located in the Southeast (52 in the state of São Paulo), whereas 10 (11%) are located in the Southern region, 13 (15%) in the Northeastern region, one (1%) in the Northern region and one (1%) in the Central-Western region (3). This demonstrates that the contribution to research on a regional scale follows the same pattern of disparity observed in the development of the country (3).

However, in recent years the federal government has established polices aimed at diminishing these disparities in scientific involvement and official programs, such as the National Academic Cooperation Program-New Frontiers, enable the exchange of experiences between universities in order to strengthen institutions in the Northern, Northeastern and Central-Western regions (10). The disparity between geographic regions in level of participation at meetings of the SBPqO may also be related to transport logistics and displacement of researchers because the event takes place in São Paulo, thus facilitating the participation of researchers from the Southeast.

The majority of research in pediatric dentistry was carried out at public institutions (71.6%); private institutions contributed 27.5% and only 0.5% of the research was carried out by dental associations. These findings corroborate those described in 2008 by Scarpelli et al. (3), who reported that, considering the entire national production, 90.3% of research grant holders conduct research at public institutions and 9.7% at private institutions. The predominance of studies conducted at public institutions may stem from the fact that the government is the main sponsor and executer of scientific/technological activities in Brazil (11).

The abstracts analyzed in the present study addressed a wide range of topics, the most prevalent of which were dental trauma, diagnosis of dental caries, the relationship between diet and dental caries, endodontic medication, developmental enamel defects, glass ionomer cement and dental care for pregnant women. Dental caries and trauma remain prevalent conditions among Brazilian children. The last epidemiological dental survey in the country (12) reported a prevalence of dental caries of 27% among children between 18 to 36 months, 60% among five-year-old children and 70% among 12-year-old children. The results of a study carried out in 2010 revealed a high prevalence (62.1%) of traumatic dental injury in the primary dentition (children between 60 and 71 months of age) in an important city in Brazil (13). Thus, dental caries and dental trauma are expected to be a recurrent theme in pediatric dental research, as observed in the present study.

Developmental enamel defects were thoroughly studied in the 1960s. However, interest in this subject waned in subsequent years. In recent years, these defects have once again come to the forefront of investigations, because of the interface with systemic conditions and the growing concern about the relationship between oral and general health. These conditions are also a concern in dental care for pregnant women, which was one of the emerging themes discussed in pediatric dental research in 2009.

In agreement with the present results, Poleto and Faraco Jr. (7) found that cariology was the most studied topic, accounting for 15.3% of articles, whereas operative dentistry/dental materials and infants/pregnant women accounted for 10.8% and 10.3%, respectively. At the international level, in 2001 Nainar (14) evaluated publications of the Journal of Dentistry for Children and Pediatric Dentistry (1969 to 1998) over three decades and found that the most popular fields of research were oral medicine, pathology and surgery; however, publications listed under caries diagnosis, etiopathogenesis and epidemiology increased considerably in the 1990s. In 2001, Yang et al. (15) conducted a bibliometric analysis of the Medline database regarding pediatric dentistry and found that 42% of the pediatric publications per year were related to oral medicine and radiology. The number of publications on restorative dentistry increased by 9%, those on endodontics increased by 9% and those on oral surgery and orthodontics increased by 6%. These findings differ from those observed in the present study, most likely because they refer to the 1990s.

In recent years, the number of cross-sectional studies in pediatric dentistry has increased, and was the most prevalent (52.5%) in the present bibliometric study, whereas the number of randomized clinical trials maintained nearly the same (approximately 2.5% of the total research). In 2009, Poleto and Faraco Jr. (7) found that the most often employed study design between 1998 and 2007 was case report (32.9%), whereas cross-sectional studies represented 29.7% and only 2.4% were randomized clinical trials. In 2007, Oliveira et al. (16) evaluated the study designs of papers published in Brazilian dental journals and found that the most prevalent ones were *in vitro* studies (24.6%), literature reviews (23.9%), case reports (19.5%) and cross-sectional studies (15.8%). Clinical trials accounted for 6.4% and systematic reviews accounted for 0.1%. In the present study were obtained similar results for active *in vitro* laboratory

studies (23.5%). However, this study design corresponds to only 8.9% of the publications assessed by Poleto and Faraco Jr. (7). The SBPqO only accepts research studies; therefore, neither case reports nor literature reviews were among the abstracts evaluated. Nonetheless, the authors cited above demonstrate that these types of designs remain very common in Brazilian pediatric dentistry literature.

Although SBPqO is a national research event, this paper presents a limitation because it was developed as a cross-sectional study, based on abstracts published at the 26th meeting (2009) and does not faithfully represent the scientific contribution of the country. It is known that only approximately 26.5% of abstracts presented at SBPqO are actually published in scientific journals (17), and it becomes difficult to identify all published national research studies because research is often conducted in Brazil but articles are published outside of the country.

Another bias that should be considered is that reading abstracts is not always enough to conduct a thorough evaluation of the research presented. In many situations the results of the studies are divided into more than one abstract for the meeting, but are aggregated into a single article to give greater strength to the data.

These difficulties can lead to new studies to assess how many abstracts accepted for the SBPqO eventually generated scientific articles, to determine the time elapsed between the event and publication, to evaluate the quality of scientific journals in which they were published and whether they were published in national or international journals.

Conclusions

Based on the abstracts of the 26th SBPqO meeting, pediatric dentistry was one of the most studied specialties in 2009, demonstrating the importance of this field in national research. Despite this expressive contribution, studies with a considerable potential for establishing scientific evidence, such as randomized controlled trials, were sparse in the year analyzed. Therefore, the quality of scientific research in pediatric dentistry in Brazil should be improved, and researchers in this field should utilize more advanced methodology.

References

1. Cury JA. The evolution of dental research in Brazil. Braz. Oral Res 2004;18:97.
2. Barreto ML. Growth and trends in scientific production in epidemiology in Brazil. Rev Saúde Pública 2006;40:1-6.
3. Scarpelli AC, Sardenberg F, Goursand D, Paiva SM, Pordeus IA. Academic trajectories of dental researchers receiving CNPq's productivity grants. Braz Dent J 2008;19:252-6.
4. Cavalcanti AL, Melo TRNB, Barroso KMA, Souza FEC, Maia AMA, Silva ALO. Perfil da pesquisa científica em Odontologia realizada no Brasil. Pesq Bras Odontoped Clin Integr 2004;4:99-104.
5. Dias AA, Narvai PC, Rêgo DM. Tendências da produção científica em odontologia no Brasil. Rev Panam Salud Publica/Pan Am J Public Health 2008;24:54-60.
6. Kanashiro LN. Panorama social, econômico e político da Odontologia – Odontologia no Brasil. Jornal Brasileiro de Odontopediatria e Odontologia do Bebê 1998;1:15-33.
7. Poletto VC, Faraco Jr IM. Bibliometric study of articles published in a Brazilian Journal of Pediatric Dentistry. Braz Oral Res 2009;24:83-8.
8. Amorin KPC, Alves MSCF, Germano RM, Costa ICC. The construction of knowledge in Dentistry: the scientific production of three Brazilian magazines from 1990 to 2004. Interface – Comunic., Saúde, Educ 2007;11:9-23.
9. Scariot R, Stadler AF, Assunção CM, Pintarelli CP, Ferreira FM. A map of Brazilian dental research in the last decade. Braz Oral Res 2011; 25:197-204.
10. Capes.gov.br (Internet). Brasil: Ministério da Educação, Programa Nacional de Coordenação Acadêmica – PROCAD. [cited 2010 Aug 28]. Available at: http://www.capes.gov.br/bolsas/programas-especiais/procad
11. Barreto ML. O conhecimento científico e tecnológico como evidência para políticas e atividades regulatórias em saúde. Ciência & Saúde Coletiva 2004;9:329-338.
12. Brasil, Ministério da Saúde, Secretaria de Atenção à Saúde, Departamento de Atenção Básica, Coordenação Nacional de Saúde Bucal. Projeto SB Brasil 2003 – Condições de saúde bucal da população brasileira 2002-2003: resultados principais. Brasília: MS-CNSB 2004; 68 p.
13. Viegas CM, Scarpelli AC, Carvalho AC, Ferreira FM, Pordeus IA, Paiva SM. Association between treated/untreated traumatic dental injuries and impact on quality of life of Brazilian schoolchildren. Eur Dent J Paediatr Dent 2010;11:59-65.
14. Nainar SM. Profile of pediatric dental literature: Thirty-year time trends (1969-1998). J Dent Child 2001;68:388-90.
15. Yang S, Needleman H, Niederman R. A bibliometric analysis of the pediatric dental literature in Medline. Pediatr Dent 2001;23:415-8.
16. Oliveira GJ, Oliveira ES, Leles C. Tipos de delineamento de pesquisa de estudos publicados em periódicos odontológicos brasileiros. Rev Odonto Cienc 2007;22:42-7.
17. Broch J, Bergoli CD, Rosa RA, Amaral M; Kaizer OB, Ardenghi TM. Posterior publicação dos resumos apresentados na reunião da Sociedade Brasileira de Pesquisa Odontológica. Braz Oral Res 2011;25(Suppl. 1):247.