Factors Associated with Access to Oral Health in Brazil: a Systematic Review

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Recebido em: 25/08/16; Aceito em: 10/01/17

Abstract

The universal access to oral health has barriers that are built by political, economic, social organizational, technical and individuals factors. The aim of this study was to identify the factors associated to the oral health access in Brazil. It is a systematic review study. First it the formulation was elaborated to the question to subsidize the literature revision and electronic data bases search. Then, the Boolean operators and key words were selected. After the application of the filters: complete text, languages (English and Portuguese), year, Subject and type of document (complete article) 148 articles remained in the search. Next the titles and summaries of the articles found in the searches carried out in the bases of data between 2000 and 2014 were read and 63 articles remained in the search. 32 articles were analyzed. In 2008 6 (18,75%) articles followed by 2012 and 2014 with 5 (15,65%) of the publications, being that there was predominance of the cross section type 30 (93,75%) with cálculo amostral representativo para a população de estudo. O acesso à saúde bucal tem sido analisado com o foco na utilização dos serviços de saúde bucal por meio de estudos epidemiológicos transversais representativos para a população de estudo. Existe um conjunto de fatores sociais, econômicos, de organização da assistência e individuais que se relacionam de forma tensionada, desequilibrada e de dependência ao longo dos anos analisados.

Keywords: Oral Health. Health Services Accessibility. Unified Health System. Dental Health Services.

Introduction

The analysis of the access level to oral health is important for the health policies and programs formulation1-2. In addition to providing subsides for the oral health planning in accordance with with the real services’s users demands3-5.

Towards the addressing of the access to oral health issue was the restructuring of the National Policy for Oral Health - PNSB with the expansion and decentralization of health care network by increasing the oral services supply1. However, according to the National Health Survey - PNS that examined the access and use of Brazilians, aged over 18 years old, to the health oral services6, in 2013, the dental service in Brazil occurred predominantly in private clinics, totaling 74.3% of the visits6. The basic health units were responsible for 19.6% of dental care6. The survey estimated that people aged 18 years old or older (11.0%) lost all their teeth, corresponding to 16 million teeth6. Approximately 41.5% of people aged 60 years old or older lost all their teeth, having the same occurred with 22.8% of people without educational instruction or with Incomplete basic educational level6. Thus, it is not clear whether the increase in the dental services supply and the National Oral Health Policy (NOHP) decentralization were able to reduce inequalities in oral health access in Brazil5,7-12. Evidences show the existence of political, economic, social, organizational, technical and individual factors influencing the access to oral health13-17. Thus ‘measuring’ access to oral health is a complex task because it involves both measurable
(objectives) and abstract (subjective) aspects.

The objective of this study was to identify the factors associated with oral health access in Brazil.

2 Development

2.1 Methodology

It is a systematic review study. For this study, a search protocol was constructed for the preparation of a systematic review\(^\text{18}\). First an inquiry was elaborated to subsidize the literature review for the electronic databases search. Thus, the question was: «What are the factors associated with oral health access in Brazil?». Then the PubMed/Medline, Lilacs, SciELO, Scopus and Bireme/BVS electronic databases were selected to construct the literature review\(^\text{17}\). It was used the Boolean operator “OR” and “AND” that allow to extend or specify the search for the best information about a particular subject, in addition to the quotation marks for composed words so that at the time of the search words are retrieved together. The following valid descriptors were selected “Access”; “Access to Health Services”; “Universal Access to Health Care Services”; “Use”; “Oral Health”; “Inequalities in Health”; “Public Health Policies”; “Oral Health Services”; “Assessing the Health Systems Performance”; “Health services Evaluation”; “Health Evaluation”. In this phase 1,236 documents were selected. After the application of filters: full text, languages (English and Portuguese), Year (2000 to 2014), Subject and type of document (complete article) 148 articles remained in the search. Next, the titles and abstracts of the articles found were read and 63 articles remained. The articles were read throughout and disregarded those that were in duplicate, qualitative methodology, literature review, systematic review, non-epidemiological, experimental and descriptive and out of the defined limits as an object of study and published previously to 2004. It was adopted as a criterion the year 2004 according to the PNSB\(^\text{1}\). Then the checklist proposed by Transparent Reporting of Systematic Reviews and Meta-Analyses (PRISMA) group was applied to enlarge the selection methodological rigor\(^\text{18}\). The PRISMA recommendation consists of a checklist with twenty-seven (27) items and a Flowchart\(^\text{18}\). The objective is to help the authors to improve the reporting of systematic reviews and meta-analyses\(^\text{18}\). The information flow through the different phases of a systematic review was based on the proposal of the PRISMA group\(^\text{18}\). (Annex 1). A researcher PhD in public health was consulted in case of doubt about the articles’ inclusion or exclusion.

This study includes a research that aimed to analyze oral health access in a Brazilian city and it was submitted to Piracicaba Dental School ethics committee in research with an approved protocol number 111/2015.

2.2 Discussion

32 articles about were analyzed the factors associated with oral health access. (Figure 1).

Figure 1: Flow chart of the articles included in the systematic review

Source: Research data.

Between 2004 and 2014 every year articles were published except in 2007. In 2008 6 articles were published (18,75 %) followed by 2012 and 2014 with 5 (15,65%) publications. A growth of trend in the number of publications since 2004 on the subject have been observed with a mean of 2.90 and an average of 3 publications. (Figure 2).

Figure 2: Historical series of papers included in the systematic review

Source: Research data.

Secondary data were used in 12 (37,50%) of the papers. The National Survey of Sample per Household (PNAD)\(^\text{19}\) was the most used population base study as a source data (Table1).
Table 1: Characteristics of systematic review articles of access to oral health, Brazil, 2015

<table>
<thead>
<tr>
<th>Authors (Year)*</th>
<th>Sample (local)</th>
<th>Sample calculation</th>
<th>Goal</th>
<th>Study type / statistical analysis</th>
<th>Associated factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bós e Bós (2004)</td>
<td>7920 elderly from Rio Grande do Sul (CEI-RS)</td>
<td>Yes</td>
<td>Choice of dental treatment by the elderly</td>
<td>Cross section / Logistic Regression</td>
<td>Gender, age, education, income and family size</td>
</tr>
<tr>
<td>Matos et al. (2004)</td>
<td>28,943 Brazil PNAD</td>
<td>Yes</td>
<td>Use of dental services by the elderly</td>
<td>Cross section / Multinomial Logistic Regression</td>
<td>Socioeconomic and demographic</td>
</tr>
<tr>
<td>Fernandes e Peres (2005)</td>
<td>293 cities from Santa Catarina (SC)</td>
<td>-</td>
<td>Associate factors with primary care, socioeconomic and supply of dental services</td>
<td>Ecological / Spearman / $X^2$ / Kruskall-Wallis</td>
<td>Improving of the coverage is related to the dentists number increase</td>
</tr>
<tr>
<td>Pinheiro e Torres (2006)</td>
<td>384,834 Brazil PNAD</td>
<td>Yes</td>
<td>Analysis of subjects and the context of use of dental services in Brazil</td>
<td>Cross section / $X^2$ / Hierarchical Logistic Regression</td>
<td>Use less: elderly, non white men., less educated, without health insurance, residents in rural and poorer areas</td>
</tr>
<tr>
<td>Bousquat, Alves e Elias (2008)</td>
<td>173 in 3 cities from São Paulo</td>
<td>Yes</td>
<td>Profile of health services use</td>
<td>Cross section / Methodological / Bonferroni</td>
<td>Man, educational level, employed and having health care plan</td>
</tr>
<tr>
<td>Freddo et al. (2008)</td>
<td>1,170 students from Gravataí (RS)</td>
<td>Yes</td>
<td>Oral hygiene habits relating to the use of dental services</td>
<td>Cross section / Cox Regression</td>
<td>Healthy lifestyle</td>
</tr>
<tr>
<td>Kramer et al. (2008)</td>
<td>1,092 subjects from Canela (RS)</td>
<td>Yes</td>
<td>Dental services analysis for children aged 0 to 5 years</td>
<td>Cross section / $X^2$ / Logistic Regression</td>
<td>Female and the Elderly</td>
</tr>
<tr>
<td>Manhães e Costa (2008)</td>
<td>7,756 subjects from Rio de Janeiro PNAD</td>
<td>Yes</td>
<td>Access analysis and use of dental services</td>
<td>Cross section / Multiple Logistic Regression</td>
<td>Access limitation in individuals with low socioeconomic status and the young</td>
</tr>
<tr>
<td>Noro et al. (2008)</td>
<td>3,425 subjects from Sobral (CE)</td>
<td>Yes</td>
<td>Dental services use analysis by the children's population</td>
<td>Cross section / Multiple Logistic Regression</td>
<td>Socioeconomic</td>
</tr>
<tr>
<td>Rocha e Goes (2008)</td>
<td>827 subjects from Campina Grande (PB)</td>
<td>Yes</td>
<td>Compare the oral health service access in areas covered by ESF</td>
<td>Cross section / $X^2$ / Logistic Regression</td>
<td>Gender, age, income and education. Not associated with living or not in an ESF covered area</td>
</tr>
<tr>
<td>Araújo et al. (2009)</td>
<td>4,226 subjects from Pelotas (RS)</td>
<td>Yes</td>
<td>Dental services utilization according to age</td>
<td>Cross section / Poisson Regression</td>
<td>Education, self-reference, socioeconomic status and demand</td>
</tr>
<tr>
<td>Baldani, Almeida e Antunes (2009)</td>
<td>399 cities from Paraná</td>
<td>All</td>
<td>Associate socioeconomic factors, financial resources and dental public services</td>
<td>Ecological / Friedman / Mann-Whitney / Spearman</td>
<td>Greater financial resources provision to municipalities with the worst socioeconomic indicators</td>
</tr>
<tr>
<td>Camargo, Dumith e Barros (2009)</td>
<td>2,961 subjects from Pelotas (RS)</td>
<td>Yes</td>
<td>Evaluate the dental regular services use among adults</td>
<td>Cross section / Poisson Regression</td>
<td>Lower socioeconomic status</td>
</tr>
<tr>
<td>Fernandes, Bertoldi e Barros (2009)</td>
<td>2,988 subjects from Porto Alegre (RS)</td>
<td>Yes</td>
<td>Pattern analysis of health services covered by ESF</td>
<td>Cross section / $X^2$ / Poisson Regression</td>
<td>Female, over 60 years, white, lower socioeconomic status, poor self-perception without healthcare insurance</td>
</tr>
<tr>
<td>Baldani et al. (2010)</td>
<td>246 subjects from Ponta Grossa (PR)</td>
<td>Yes</td>
<td>Identify associated factors with dental services use for the adults and elderly</td>
<td>Cross section / $X^2$ / Multiple Logistic Regression</td>
<td>Individual factors. About 40% of adults and 67% of the elderly had not been to the dentist for more than three years</td>
</tr>
<tr>
<td>Souza e Chaves (2010)</td>
<td>148 subjects from Bahia</td>
<td>Yes</td>
<td>Evaluating supply, use and dentistry specialized actions</td>
<td>Cross section / Utilization rate / $X^2$ / Fisher exact</td>
<td>Low utilization rate for endodontics and surgery. Integrality lower among adults who required dental prostheses</td>
</tr>
</tbody>
</table>
### Fatores Associados ao Acesso à Saúde Bucal no Brasil: Revisão Sistemática

<table>
<thead>
<tr>
<th>Authors (Year)*</th>
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<th>Sample calculation</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Gibilini et al. (2010)[5]</td>
<td>4.217 subjects From SB-São Paulo/2002</td>
<td>Yes</td>
<td>Conditions analysis of dental services access</td>
<td>Cross section / $X^2$</td>
<td>Adolescents and adults access the service less than 1 year and elderly over 3 years</td>
</tr>
<tr>
<td>Baldani e Antunes (2011)[6]</td>
<td>747 subjects from Ponta Grossa (PR)</td>
<td>Yes</td>
<td>Access inequalities in dental services ESF areas</td>
<td>Cross section / Poisson Regression</td>
<td>Age, better social status and dentist regular use</td>
</tr>
<tr>
<td>Celeste et al. (2011)[7]</td>
<td>Brazil (regions)</td>
<td>-</td>
<td>Temporal pattern of dental procedures between 1994 and 2007</td>
<td>Ecological / Mouth rate / Moving Average</td>
<td>Procedures increase with the inclusion of dentistry in the ESF</td>
</tr>
<tr>
<td>Celeste, Nadanovsky &amp; Fritzell (2011)[8]</td>
<td>108.921 Brazil SB/2003 and Sweden LNU</td>
<td>Yes</td>
<td>Compare the use of dental services between Brazil and Sweden</td>
<td>Cross section / Poisson Regression</td>
<td>Higher socioeconomic status attending more the dentist. Decline in utilization</td>
</tr>
<tr>
<td>Chaves et al. (2011)[9]</td>
<td>2.539 subjects in 2 cities from Bahia</td>
<td>Yes</td>
<td>Compare specialized services access</td>
<td>Cross section / $X^2$</td>
<td>Type and nature of the service, sex, education and income</td>
</tr>
<tr>
<td>Chaves et al. (2012)[10]</td>
<td>2.539 subjects in 2 cities from Bahia</td>
<td>Yes</td>
<td>Compare the use of dental service between primary and specialized care</td>
<td>Cross section / $X^2$</td>
<td>Primary care access barriers. Individual preventive actions little reported</td>
</tr>
<tr>
<td>Machado et al. (2012)[11]</td>
<td>3.391 adults and elderly from Porto Alegre (RS)</td>
<td>Yes</td>
<td>Estimate the prevalence of regular use of dental services for the adults and elderly</td>
<td>Cross section / $X^2$ / Wald / Poisson Regression</td>
<td>Sex, education, income, type of service used, self perception</td>
</tr>
<tr>
<td>Pavão et al. (2012)[12]</td>
<td>759 subjects from Rio de Janeiro</td>
<td>Yes</td>
<td>Analyze the use of health care for university workers</td>
<td>Cross section / $X^2$ / Kruskall-Wallis / Poisson Regression</td>
<td>Lower socioeconomic status</td>
</tr>
<tr>
<td>Peres et al. (2012)[13]</td>
<td>384.834 and 391.868 subjects from Brazil PNAD</td>
<td>Yes</td>
<td>Dental services access analysis in Brazil</td>
<td>Cross section / Prevalence Ratio / $X^2$ / Midspread</td>
<td>Increased use of dental services and inequalities between social groups</td>
</tr>
<tr>
<td>Peres et al. (2012)[14]</td>
<td>54.367 subjects from Brazil- capitals VIGITEL</td>
<td>Yes</td>
<td>Analyze the pattern of use and lack of access to dental care</td>
<td>Cross section / Poisson Regression</td>
<td>Women, younger, with inferior educational level and mixed race</td>
</tr>
<tr>
<td>Miquilin et al. (2013)[15]</td>
<td>152.233 subjects PNAD/2008</td>
<td>Yes</td>
<td>Associate employment relationship to health services access</td>
<td>Cross section / Prevalence Ratio / Poisson Regression</td>
<td>Unequal access of unemployed and informal workers</td>
</tr>
<tr>
<td>Fonseca et al. (2014)[16]</td>
<td>57.231 patient records from Piracicaba (SP)</td>
<td>All</td>
<td>The service offered in primary care regarding emergency service</td>
<td>Cross section / $X^2$ / Multiple Logistic Regression</td>
<td>Increased use in areas of greater social vulnerability</td>
</tr>
<tr>
<td>Gomes et al. (2014)[17]</td>
<td>2.273 children and adults from Maranhão (MA)</td>
<td>Yes</td>
<td>Oral health services use evaluation</td>
<td>Cross section / $X^2$ / Fisher exact / Wald</td>
<td>Low use by adults and children with low socioeconomic status</td>
</tr>
<tr>
<td>Haikal et al. (2014)[18]</td>
<td>780 subjects from Montes Claros (MG)</td>
<td>Yes</td>
<td>To associate tooth loss and access to oral health information</td>
<td>Cross section / Multiple Linear Regression (Stepwise)</td>
<td>Adults who have not received information about oral hygiene and lost more teeth due to decay</td>
</tr>
<tr>
<td>Martins et al. (2014)[19]</td>
<td>5.349 subjects from Brazil (SB/2003)</td>
<td>Yes</td>
<td>To identify factors with negative evaluation of dental services for the elderly</td>
<td>Cross section / $X^2$ Linear trend / Logistic Regression</td>
<td>Public service / philanthropic, men, higher education without oral health information</td>
</tr>
<tr>
<td>Rodrigues et al. (2014)[20]</td>
<td>754 children from Montes Claros (MG)</td>
<td>Yes</td>
<td>To associate factors with low use of dental services</td>
<td>Cross section / $X^2$ / Logistic Regression</td>
<td>Age, social status and parental access to preventive information</td>
</tr>
</tbody>
</table>

(*) Citation and article reference

Source: Research data.
The methodological design predominance was the transversal type with 30 (93.75%) articles and sample size calculation. No longitudinal epidemiological studies were found. In the Southern region 11 articles (34.38%) were performed, followed by the South East with 7 (31.40%) and Northeast with 6 (18.75%). Studies in the North and Midwest regions were not performed. In addition to the 8 (25%) of the studies being carried out with national data. (Table 1).

A lot of studies used multivariate statistical analysis. The predominant ones were logistic regression with 11 (33.33%) and Poisson regression with 9 (28.12%). The main associated factors were age, gender, education, socioeconomic status and coverage of dental care. However, a pattern in the variables, age and education was not identified, used in the studies. There was also a pattern in relation to the type of dental service studied: public or private/health care insurance studied. However, there was a trend for analysis of access to public services, oral health in relation to the service nature: Basic Care, Family Health Strategy (ESF), specialized or Emergency/Urgency. (Table 1).

The concept of access to oral health varied among the authors and it was used as a synonym for «use», «utilization» of oral health service.20,21 To Manhães and Costa22 the concept is unclear and is related to the customers’ adequacy to the health system through a health care guarantee. However, the concept of oral health access has become more complex with the incorporation of aspects that are difficult to measure such as those related to health policy and self-perception.23-26 Thus, the restructuring of PNSB1 may have triggered the interest of research on oral health access focused on the assistential perspective. Therefore, there is a need to improve the concept of access to oral health with the incorporation of political, organizational, symbolic dimensions in further studies.

The methodological diversity, study design and variables used, make it difficult to compare the findings of the studies and provides a study limitation.

To Fernandes and Peres27 and Camargo et al.28, access to dental services in Brazil is limited and uneven and these conditions are the result of socioeconomic factors. The own social segments have different demands for health that are resulting from the exclusion processes and that are not always visible or become public policies.23,27 Study showed an association of less frequent dental services uses among the poorer Brazilian states, with less structure, with lower supply of dental sand medical service and more complex health services.29 Comparative studies between Brazil and Sweden pointed out that there are disparities in the use of dental services and those individuals with better economic conditions visit the dentist regularly.30 In other words, individuals with better socioeconomic conditions have conditions to purchase dental service (health care insurance or payment for the oral services).31,32 On the other hand, individuals with lower socioeconomic level seek oral public service.33 Previous studies indicate that access to oral health is also related to healthy lifestyle and access to actions of health prevention and promotion.34,35 To Pavão et al.36 and Miquilin et al.37 it is necessary to expand the access strategies to traditionally excluded sectors as informal workers and the unemployed.

There was an increase in the number of dental procedures performed due to the increase in dental services supply in primary care, however the specialized care did not catch up with it at the same speed.38,39 A study points out that the main barrier is in primary care and that there is little interface of specialized care with primary care (counter-reference).40 This fact can be explained because many users of specialized services tend to use it as an alternative entrance door for oral health care.41 Study suggests the expansion of oral health actions as an alternative to improve the redistribution of human and financial resources in favor of places with the worst socioeconomic indicators.42,43 However, being a resident or not in a covered area by the Family Health strategy - ESF was not associated with the access to oral health services.41,44 Moreover, in Brazil, the different regional realities produce different forms of organization and health systems management that jeopardize the access quality and oral health public care.3,11,41

The existence of technical and geographical barriers factors such as limiting access to oral health provides an imbalance in the relationship between supply/demand and impact on the schedule, waiting time and waiting line.45,46 So, the dependence of technology materials and organization of the services network for oral health can impose obstacles to the oral health access.46

Studies indicate those inequalities in access to oral health, especially for children and the elderly.47,48 Study conducted in Paraná has identified that 67% of the elderly respondents had not been the dentist for more than three years.49 In São Paulo it was also identified that the elderly are the ones that had been longer without accessing oral health services.50 The perception of oral health has been identified as a predictor of search for dental service with impacts on the services use. This is more evident in self-perception studies of oral health in the elderly concerning the history of exposure to risk factors, reasons for the use of oral health services, self-image, condition to pay for the service.24,26,30 The age range of children aged less than 5 years old, only 13.3% had already been to the dentist, and only 4.3% had some type of dental consultation until the first year of life.51 In a study conducted in Maranhão more than 91% of the children did not use the Oral Health Services - OHS in the six months before the interview.52 The use of OHS was higher among children whose heads of a household had more than 11 years of study and bettersocioeconomic conditions.52

The lower access of non-whites to dental services may be the result of the historical process of social exclusion.29,42,47 However, the skin color variable showed no statistical significance in the crude and adjusted analysis in another
study and it can be explained the reasons why the differences in the use of ESF are less unequal when compared to other health services\textsuperscript{34}. Regarding gender, it was observed that women use health services significantly higher than men and visits to the gynecologist/obstetrician could be observed and better perception of health risks factors \textsuperscript{31,34,45,47}.

3 Conclusion

The oral health access has been discussed with the focus on the use of the oral health services by cross-section studies. There is a set of social and economic factors, as well as regarding the organization of assistance and individual factors which modulate the oral health access. The social context is a challenge for the oral health care and the construction of the Unified Health System - SUS as a social inclusion policy.

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J Health Sci 2017;19(1):47-54

Fonseca EP, Fonseca SGO, Meneghim MC