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| ORIGINAL

# *Food diet and representations of dental caries published in a traditional brazilian newspaper*

# *Dieta alimentar e representações da doença cárie publicadas em um tradicional jornal brasileiro*

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## ABSTRACT

**Objective**: To apprehend the representations of dental caries present in a Brazilian print media, considering different historical periods, with emphasis on the dietary factor in the issue of etiology and disease prevention. **Methods**: This is a descriptive documentary research study carried out from the analysis of digitalized printed editions of Jornal do Brasil, published between 1891 and 1990, available for consultation on the electronic portal of the collection of periodicals entitled Brazilian Digital Library. For the search, the terminologies 'cárie dentária' and 'cárie dental' (both meaning dental caries) were used. The platform displays editions from pre-determined time periods. The displays were considered for all journalistic genres, composing or not the main or prominent theme. The data found were analyzed qualitatively. **Results**: In total, 675 occurrences were registered with the term 'cárie dentária' and 33 with the term 'cárie dental'. The representations of dental caries had multiple and complex variations. The object reconstruction process generated the categories: prevention, public policy and etiology. The topic of food diet significantly crossed the entire time span studied and remained frequently linked to tooth decay, sometimes related to the etiology, sometimes to the prevention of the disease. **Conclusion**: Jornal do Brasil reflected old knowledge in the field of dentistry, added new scientific knowledge and popularized it for the readership of the written press.

**Indexing terms**: Communications media. Dental caries. Diet. Qualitative research.

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## RESUMO

***Objetivo**: Apreender as representações da cárie dentária presentes em um veículo da mídia impressa brasileira, considerando diferentes períodos históricos, com destaque para o fator dieta alimentar na questão da etiologia e da prevenção da doença. **Métodos**: Trata-se de pesquisa documental de caráter descritivo, realizada a partir da análise de edições impressas digitalizadas do Jornal do Brasil, publicadas entre 1891 e 1990, disponíveis para consulta no portal eletrônico de acervo de periódicos intitulado Hemeroteca Digital Brasileira. Para a busca foram utilizadas as terminologias 'cárie dentária' e 'cárie dental'. A plataforma expõe as edições a partir de períodos de tempo pré-determinados. As aparições foram consideradas para todos os gêneros jornalísticos, compondo ou não tema principal ou de destaque. Os dados encontrados foram analisados qualitativamente. **Resultados**: No total, foram registradas 675 ocorrências com o termo 'cárie dentária' e 33 com o termo 'cárie dental'. As representações da doença cárie tiveram múltiplas e complexas variações. O processo de reconstrução do objeto gerou as categorias: prevenção, política pública e etiologia. O tema dieta alimentar atravessou significativamente todo o arco temporal pesquisado e permaneceu frequentemente ligado à cárie dentária, ora relacionado à etiologia ora à prevenção da doença. **Concsluão**: O Jornal do Brasil refletiu antigos conhecimentos do campo da odontologia, agregou novos saberes científicos e os vulgarizou para o público leitor da imprensa escrita.*


***Termos de indexação***: *Meios de comunicação. Cárie dentária. Dieta. Pesquisa qualitativa.*

## INTRODUCTION

Deficient oral health is strongly related to lower socioeconomic conditions, demographic aspects, lifestyle and hygiene. Dental caries, present since childhood, is one of the most prevalent problems related to the oral cavity and, in adulthood, it is one of the main causes of edentulism, together representing an imposing public health problem, reinforcing the need for preventive actions, full access to the strategies and actions developed by the oral health services and education of individuals regarding their self-care [1]. However, this clarity of factors and importance of individual accountability was not always such. The scientific determination of dental caries has been widely discussed over time, being the object of many theories. First, at the end of the 19th century and in light of the new knowledge addressing the health-disease process, single-cause models emerged, divided between those that prioritized microorganisms as an etiological agent and those that gave greater importance to sugar [1].

In this context, diet is then linked to caries – not only from discussions on the etiology of the disease, but also as a factor in its prevention; the relationship between eating habits and tooth decay is not established by simple observation, but rather is a scientific construction that is carried out with monitoring and control of populations for a certain period of time. These controlled models are considered as a starting point to delimit certain scientific thinking [1,2]. However, over the years, knowledge has undergone transformations according to different historical moments and their explanatory realities. As the first model to introduce multi-causality in dentistry, there is the work by Fitzgerald and Keyes [2], which considers an interaction of factors at disease onset. In this way, the single-cause models started to be expanded by the recognition of the participation of ecological and, later, social factors. The consequences of the social epidemiology on dental caries thus appear, which have had a broad and dominant repercussion in a new and current explanatory paradigm of the disease, changing the way in which dental caries is represented [2].

Social representations are a set of concepts, statements and explanations that originate in everyday life, during communication and cooperation between individuals and groups. In this way, social representations assist in understanding and explaining facts and ideas, allowing to answer questions that fill a certain social and historical environment and to interpret the meaning of science discoveries [3].

In short, common sense is continually being created and recreated in modern societies, especially where scientific and technological knowledge is popularized [3]. In this context, the print media constitutes a source of historical research as it allows a look at the daily life of different times from diverse research materials, enabling an analysis with new interpretations and new discourses [4]. Regarding this study, it is worth noting that, at the time analyzed, certain discourses and representations related to health communication were heavily dependent on large print newspapers. They constituted one of the major sources of communication space existing in the period and issues related to news about diseases constantly crossed the pages of daily newspapers [5].

This article aims at apprehending the representations of dental caries published in Jornal do Brasil (JB), considering different historical periods and highlighting the categories of prevention and etiology and, within these categories, the subcategory of diet. The choice of JB was due to its imposing nationwide dissemination and time representation, in addition to the online availability of printed material in a retroactive manner. It deserved a specific deepening in this paper, since it was constantly present in the researched documentation, articulated to the causes and ways to avoid the disease. This allowed visualizing changes and permanencies that relate eating habits with dental caries and thus also a reflection on the popularization of certain scientific knowledge in the field of Dentistry in the time frame analyzed.

## METHODS

This is a descriptive and documentary research study carried out from the analysis of all digitized printed editions of Jornal do Brasil, published between 1891 (year of its foundation) and 1990, displayed for consultation on the electronic portal of journal collection entitled Brazilian Digital Library (http://bndigital.bn.br/hemeroteca-digital/), with public and free access. All the time possibilities available in the digital system were included in the study.

The search platform allows selecting the vehicle to be researched; after such delimitation, predetermined periods of time are automatically exposed (as shown in the results), leaving the researcher to select only one, several or all of the established periods and, subsequently, to insert terms for the search. In this study, to search for findings related to the study object, the terminologies 'cárie dentária' and 'cárie dental' (both meaning dental caries) were used, considering their appearance in all journalistic genres, composing or not the main or prominent theme. The results followed the following stages: a) identification and skimming of the contents linked to the categories that stood out - prevention and etiology – for full apprehension of meaning; b) exhaustive reading and analysis of the contents, dividing them into categories, subcategories, registration units and context units; c) analysis of the social role and the historical and time context of the contents. The content identification stage revealed caries terminologies inserted in sentences related to public sector recruitment examination, literary publications, scientific events, advertisement for dentists' offices and advertisement for various oral supplies. These points were not considered for the analysis, since they are not the object of this study.

Data collection was conducted by a trained researcher and lasted eight months (from December 2018 to August 2019). After the collection period, the data were qualitatively analyzed by two researchers with experience in qualitative tabulation, enabling the interpretations reached in the study. The findings relevant to the categories of interest were exposed through categorized tables, divided by temporal dimension, according to the historical evolution of health policies in Brazil, proposed by Acurcio [6], namely: 'The First Republic' (1889–1930), 'The Vargas Era' (1930–1945), 'The Redemocratization Period' (1945–1964), 'The Military Government' (1964–1980), and 'The 80s'.

The charts also contain the total number of occurrences of the registration units found and their most representative extracts. The findings were discussed under the light of the pertinent literature.

## RESULTS

From the universe researched in the Jornal do Brasil editions, a total of 675 occurrences were found with the term 'cárie dentária' and 33 with the term 'cárie dental' (both meaning dental caries), with 190, 157, 79, 198 and 84 citations in the periods analyzed, respectively, in ascending time order.

Chart 1 shows the results of the analysis of the period related to 1891-1930, called 'The First Republic'. It was verified that, in the prevention category, the oral hygiene/use of toothpaste subcategory was the one with the highest number of publications. In this context, many occurrences of the cárie dentária or cárie dental terminologies in JB were linked to several advertisements for dental surgeon services in commercial advertisement pages, which is consistent with the moment of urban transformations in the federal capital. In addition to the individual-disease relationship expressed

in advertisements from dental offices, concerns about oral health that expressed collective concerns also emerged during the period.

**Chart 1** – Categorization of the dental caries representations in Jornal do Brasil, by time dimension (n=190). Brazilian Digital Library. 1891-1930. The First Republic.

| Category | Subcategory | N | Registration unit | Context unit |
|---|---|---|---|---|
| Prevention | Toothpaste | 112 | Use | "*Mouth hygiene* requires the use of toothpaste (...) excellent preparation for tooth conservation and a fresh breath; to avoid scurvy, loose gum, tooth decay". |
| | Mastication | 01 | Quality | "The *prophylaxis* of dental caries and dental *pyorrhea* is almost exclusively in perfect mastication". |
| Public policy | Institution | 04 | Assistance: schoolchildren | "The São Paulo School Dental Association (*Associação Paulista Dentária Escolar*) was founded due to the extraordinary number of cases of dental caries among schoolchildren". |
| | Request | 02 | Assistance: schoolchildren | "(...) *appealing* to the precious concurrence of our proletariat so that Child Dental Care becomes a reality as soon as possible". |
| Etiology | Diet | 16 | Determining factor | "Much has been discussed about the numerous causes, in fact, of tooth decay. For not a small number of researchers, the influence of food is preponderant". |

Note: *Fifty-five representations were not considered for the analysis.

Despite the fact that diet has appeared in few publications, the etiological understanding of the disease was also related to the factors of eating and chewing. Some texts pointed out a diet that stimulated the onset and evolution of the disease as the cause of tooth decay. In an article dated February 7th, 1925 (JB, p. 7), and based on a publication in the British Medical Journal, the journal pointed out oatmeal as an "unfavorable influence" on oral health, especially among children. This same article mentioned food products beneficial to the "formation of well-classified and regularly planted teeth", namely: those that had "abundant A vitamins", such as "cod liver oil, milk and egg yolk" (Idem, p. 7).

Chart 2 encompasses the 1930-1945 period, 'The Vargas Era'. The prevention category continued to exhibit a large number of publications, addressing the need to remove dental plaque for disease control. The public policies were based on the expansion of the assistance provided to schoolchildren, reproducing the same oral health care model as in the previous period. A note from the Dental Service of the Municipal Schools of the federal capital municipal government, in line with the Eugenic ideas circulating in the field of health, stated that dental caries was a "true social scourge" and a "degenerator of the race" (JB, 02/22/1934, p. 6). The etiology of the disease was related to diet, but allied to the presence of other factors such as saliva, erosion, microbiology, parathyroid gland and the environment. The article signed by Dr. Motta Rezende, on June 3rd, 1934 (JB, p. 14), under the title of "Dental Changes by Avitaminosis", started as follows: "From a practical point of view, vitamin deficiencies are of interest to Dentistry as they enter the pathogenesis in three morbid ways: rickets, tooth decay and alveolar pyorrhea." For him, it was remarkable that rickets was related to "the delay in the evolution and eruption of teeth, [which was observed] not only for deciduous dentition but also for the permanent teeth" (Idem).

Chart 3 represents the result of the 1945-1964 period, 'Redemocratization'. The highlights of this period were the constant articles on the importance of using topical fluoride in prevention campaigns for schoolchildren and the inclusion of fluoride in public water supplies, as evidenced by the large number of publications in the categories of prevention and

**Chart 2** – Categorization of the dental caries representations in Jornal do Brasil, by time dimension (n=157). Brazilian Digital Library. 1930-1945. Vargas Era.

| Category | Subcategory | N | Registration unit | Context unit |
|---|---|---|---|---|
| Prevention | Mastication | 01 | Quality | "This friction, when properly exercised, is the best mechanical cleaning agent for the oral cavity. It prevents the formation of microbial colonies and destroys those that, by chance, have already been formed". |
| | Diet | 02 | Milk and eggs | "To prevent tooth decay, milk and eggs should be used daily and abundantly but, for their proper leverage, sunbathing is essential". |
| | Oral hygiene | 43 | Quality | "The only way to prevent tooth decay is to follow a rigorous method of oral prophylaxis". |
| Public policy | Institution (creation) | 14 | Assistance: schoolchildren | "Considering tooth decay as a real social scourge (...). Understanding the deep scope of a perfect dental service and having to fill some vacancies in public schools, the Municipal Department of Education ordered the opening of a public sector recruitment examination in which 48 dental surgeons were classified". |
| Etiology | Diet | 06 | Low Ca content | "Therefore, tooth decay could depend on hitherto known causes: lack of calcium in food". |
| | Saliva | 02 | Teeth | "Although it is considered a *defense* element, existing in the oral environment, the action of saliva on teeth can also favor, in some cases, the formation of the caries process". |
| | Erosion | 01 | Teeth | "That's how erosion is another open door for caries microbes (...)". |
| | Microbiology | 29 | Teeth | "In fact, oral polymicrobial diseases directly influence the beginning and evolution of the caries process". |
| | Associated factors | 02 | Rickets | "(...) because tooth decay finds in rickets a very favorable predisposing factor for its development". |
| | | 04 | Parathyroid gland | "Therefore, tooth decay could depend on hitherto known causes: parathyroid gland diseases..." |
| | | 19 | Society | "Dental caries is a disease of all climates and all races. It was not known in primitive times when men lived by the law of nature". |

Note: *Thirty-four representations were not considered for the analysis.

**Chart 3** – Categorization of the dental caries representations in Jornal do Brasil, by time dimension (n=79). Brazilian Digital Library. 1945-1964. Redemocratization.

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| Category | Subcategory | N | Registration unit | Context unit |
|---|---|---|---|---|
| Prevention | Fluorides | 04 | Topical | "It was concluded that four topical applications of a 1% to 2% sodium fluoride solution, at intervals of a certain period of time, and carried out after previous cleaning of the dentures, prevent tooth decay in a proportion equivalent to 40%". |
| | | 21 | Public water supply (systemic) | "Whereas water fluoridation does not inhibit tooth decay, at least it prevents it". |
| | Acids | 01 | Mouth | "Fermentation acids in the mouth can prevent cavities instead of causing them". |
| | Magnesium milk | 05 | Use | "Magnesium milk neutralizes oral acidity and coats the teeth with a protective alkaline layer and prevents tooth decay". |
| Public policy | Institution (creation) | 02 | Prevention: topical fluoride | "Adoption of the systematization of the topical application of 2% sodium fluoride in children enrolled in the Dental Service of the Municipal Department of Children and Adolescents, aiming at the prophylaxis of dental caries". |
| | | 01 | Prevention: public water supply | "The first water fluoridation service in Brazil opens today in Baixo Guandú, State of Espírito Santo". |
| | | 09 | Prevention: campaign | "I will highlight the official support that will be given to private campaigns in favor of prophylaxis and treatment of dental caries". |

**Chart 3** – Categorization of the dental caries representations in Jornal do Brasil, by time dimension (n=79). Brazilian Digital Library. 1945-1964. Redemocratization.

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| Category | Subcategory | N | Registration unit | Context unit |
|---|---|---|---|---|
| Public policy | Request (creation) | 01 | Legislative Bill: Practical Dentist | "Congressman Pedroso Júnior, educated as he is, naturally thought that Brazil would benefit if the government allowed an expansion of the license for the practice of dental science by pseudo-professionals (...) so that the results reach the desired point: that of prophylaxis of tooth decay and other infections". |
| | | 02 | Legislative Bill: Sodium Chloride | "The project under the title of 'Minister Mário Pinotti demands sodium chloride in the salt to prevent caries'". |
| Etiology | Diet | 06 | Low vitamin D content | "Lack of vitamin D in the diet is the most important cause of tooth decay". |
| | | 02 | Sucrose | "Candy: tooth decay's greatest friend". |
| | Oral acidity | 02 | Association | "Everyone talks about oral acidity; however, this should not be attributed solely to dental caries (...), but should consider it". |
| | Microbiology | 04 | Research | "(...) a new method has been announced for isolating microorganisms that appear to be causes of tooth decay". |

public policy. The etiology category maintained the characteristics of the previous period and, in this regard, a diet low in vitamin D was closely related to tooth decay. On August 10th, 1950 (JB, p. 12), the short note entitled "Precept of the Day", from the National Health Education Service, stated: "Lack of vitamin D in the diet is the most important cause of tooth decay". The precept of that day recommended: "Use milk, butter, cream, eggs and liver, as these food options provide the necessary vitamin D for healthy teeth" (Idem).

Chart 4 presents the results of the analysis of the1964-1980 period, 'The Military Government'. A large number of publications highlighted the importance of fluoridation in public water supplies. In the prevention category, in addition to the factors mentioned in previous periods, the frequency of oral hygiene and the associated use of vitamins and fluoride were highlighted. Sujismundo (contraction of words meaning 'dirty' and 'filthy'), a cartoon character created in 1972 (JB, 09/28/1972, p. 10) for various government advertisements broadcast on television throughout the first half of the 1970s, also had to brush his teeth daily. This procedure was an integral part of a set of hygienic acts carried out by the dictatorship at that time under the slogan 'Developed people are clean people'. In the etiology category, diet is mentioned again, as well as the relationship between dental caries and acids and germs, local and systemic factors, and social habits. In the Sunday supplement of July 8th, 1973 (JB, no page number), professor Sergio Weyne, for example, highlighted that, in order to avoid the accumulation of dental plaque, food control was fundamental. He mentioned the excessive consumption of sugar present "mainly in sticky foods – candies, chocolates, jelly beans, drops" – ingested "between meals" (Idem).

Chart 5 presents the result of the 1980-1990 period. In the public policies, in addition to the water fluoridation measures, fluoride was mentioned as a means of prevention through table salt. In addition, a large number of publications on the epidemiology of the disease in the country were found, a fact that attests to a popularization of increasingly sophisticated knowledge in the field of Dentistry. Prevention presented a large number of publications, with the mention of new terms, such as Intrauterine Dentistry and dental care for pregnant women and babies. Despite these news items, articles relating caries to diet are published from time to time. In the edition of October 30th, 1989 (JB, p.16) and with the title of "To avoid caries, a good diet is better: a proper menu can even eliminate the use of toothbrushes", there is a recommendation by the president of the Brazilian Association of Dentistry Specialists and Graduate Students, Fernando

**Chart 4** – Categorization of the dental caries representations in *Jornal do Brasil*, by time dimension (n=198). Brazilian Digital Library. 1964-1980. The Military Government.

| Category | Subcategory | N | Registration unit | Context unit |
|---|---|---|---|---|
| Prevention | Vitamins and fluoride | 01 | Associated factor | "Calcium, phosphorus, iron, vitamin B12 and fluorine – an important element in preventing tooth decay – form some of the nutritional properties to be enjoyed by those who drink their mug of beer (...)". |
| | Diet | 28 | Quality and Frequency | Advising people to eat properly and at the right times (...) and to avoid giving candy and sweets to children to prevent tooth decay". |
| | Oral hygiene | 12 | Frequency | "It was concluded that, in the prevention of tooth decay, the following 10 items are of major importance: 2nd Brush your teeth after each meal". |
| | Fluorides | 07 | Topical | "The reminder is from dentist Jozy Calanzs, warning parents that the application of fluoride once a year reduces by 40% the incidence of tooth decay". |
| | | 01 | Systemic (tea) | "In the 20th century, tea proved that it has a certain number of qualities (...) a preventive action against tooth decay due to fluoride salts". |
| | Assistance | 32 | Children | "A habit that should be established: taking children to the dentist every six months. (...) Before toothache prevents the child from eating, and their parents from sleeping, going to the dentist is still the simplest (and exact) measure. The number of children who are taken to the dental office at an advanced stage of tooth decay is really frightening". |
| Public policy | Institution (creation) | 11 | Assistance: schoolchildren | "In four years of administration, the government (...) has administered dental caries treatment to more than 300,000 children in the schools". |
| | Request (creation) | 62 | Prevention: public water supply fluoridation | "At the same meeting, a project by Councilman Camil Caran (...) was approved, which requires water fluoridation in Belo Horizonte 'as an indispensable measure to reduce the incidence of tooth decay, especially in children'". |
| | | 05 | Legislative Bill | "The organizer of the single federal dental bidding procedures, Leopoldo Ferreira, from the State Servant Hospital, justified, in an interview with *Jornal do Brasil*, why he sent the draft to create the National Dental Caries Service to the Ministry of Health, indicating that the situation of children in Brazil, in this field, 'is simply chaotic'". |
| | Absence | 04 | Oral Health | "And so it goes, the Ministry of Health developing institutional health campaigns on the most diverse medical issues. (...) However, no topic is related to tooth decay (...). And all of this happens, or rather, does not happen, because the Ministry of Health is very much about Medicine and little about Dentistry". |
| Etiology | Acids and germs | 03 | Diet: quality | "Tooth decay is caused by the action of acids and germs, especially when people abuse sweets, candies, sodas and sugars". |
| | Diet | 04 | Low protein content | "A child with a deficit of good protein grows little and poorly (...) and suffers more from tooth decay". |
| | Habits | 02 | Society | "Caries, gum disease and malocclusion are linked, he said, to bad habits of civilization". |
| | Associated factor | 03 | Local and systemic | "Development of dental caries is still much discussed. (...) General and local factors come into play". |

Note: *Twenty-five representations were not considered for the analysis.

Credidio: "A good diet, more than daily brushing and the use of fluoride, would be enough to eliminate tooth decay" (Idem). The etiology of the disease was firmly related to sucrose: "Pure, non-counterfeit honey is a complete natural food product, generating calories at a rate of 328 per 100 grams, containing proteins, vitamin C, sodium, potassium, calcium, magnesium, iron, copper, phosphorus, sulfur and other substances, such as: thiamine, riboflavin, pyridoxine, pantothenic acid, folic acid, etc.; in addition to being bactericidal and with the advantage of containing only 0.1% sucrose (sugar), which, as is known, is the main cause of tooth decay" (JB, 11/01/1980, p. 23). Or in a report on food consumption of March 29th, 1981 (JB, Idem), with the title of "It's not always sweet to taste the many goodies in Rio": "Those who are in a state of hyperglycemia have impaired hearing, get dizzy, silly, with bad reflexes. Not to mention tooth decay, directly linked to sugar consumption".

**Chart 5** – Categorization of the dental caries representations in Jornal do Brasil, by time dimension (n=84). Brazilian Digital Library. 1980-1990.

| Category | Subcategory | N | Registration unit | Context unit |
|---|---|---|---|---|
| Prevention | Fluorides | 06 | Toothpaste | "(...) in the 80s, following the progress of Dentistry, fluoride was incorporated into toothpastes, becoming preventive creams for tooth decay". |
| | | 01 | Intrauterine Dentistry (pregnant women and babies) | "The benefits of fluorides may begin before babies are born if pregnant women are given fluoride tablets in the last six months of pregnancy. (...) children whose mothers had taken a fluorite pill had essentially no tooth decay for the first seven years of life". |
| | | 11 | Public water supply | "Alfredo Reis Viegas, professor of the Public Health School at USP, pointed to water fluoridation as the only way for a national preventive program to prevent tooth decay". |
| | Diet | 09 | Quality | "A good diet, more than daily brushing and the use of fluoride, would be enough to eliminate tooth decay". |
| | Intrauterine Dentistry (pregnant women and babies) | 02 | Assistance | "Treating one's teeth before they even show up; or, even more: worrying about oral health from intrauterine life (...)". |
| | Campaign | 14 | Education and Health | "The *Zona Sul* supermarket chain launched a health prevention program (...). With lectures and educational material, and the participation of physicians and dentists; the company clarifies and instructs its employees on issues such as AIDS and dental caries". |
| | | | | "We propose a change in philosophy, aiming at mass preventive care. (...) Food education and hygienic habits also represent prevention of tooth decay". |
| | Oral hygiene | 01 | Frequency | "A very simple method helped a country to eradicate caries in the population: brushing one's teeth before and after every meal". |
| | Associated factors | 06 | Medications and diet | "The search for health with a totalizing approach, contributing to the solution of gum problems, tooth decay and other oral manifestations, through homeopathic and herbal medicines and correct nutrition". |
| Public policy | Request (creation) | 03 | Prevention: salt fluoridation | "The Minister of Health, Alceni Guerra, shall launch a bold program to fight against tooth decay in Brazil (...). Instead of adding fluorine to water, the minister will do so to table salt". |
| | Institution | 05 | Prevention: public water supply fluoridation | "(...) in doing so, he will be complying with Federal Law No. 6,050 of May 24th, 1964, a law for which we have fought so hard, closely linked to the fluoridation of all waters in the country, aiming to reduce by nearly 60% the high incidence of dental caries". |
| | | 02 | Prevention: mobile Dentistry office | "The purpose of the project is to prevent tooth decay, as defined by the Municipal Health Secretary, Hugo Tomasini. For this, 50 mobile offices were purchased, manufactured in Brasília, which are maintenance-free and fully capable of being dismantled". |
| | | 05 | Prevention: campaign | "The first National Campaign for the Prevention of Mouth Diseases, with a special focus on tooth decay". |
| | Epidemiology | 15 | Survey | "Brazil is among the three countries with the highest rate of dental caries per inhabitant in the world, according to current data from the World Health Organization". |
| Etiology | Diet | 04 | Sucrose | "Pure, non-counterfeit honey is a complete natural food product, generating calories at a rate of 328 per 100 grams, containing proteins, vitamin C, sodium, potassium, calcium, magnesium, iron, copper, phosphorus, sulfur and other substances, such as: thiamine, riboflavin, pyridoxine, pantothenic acid, folic acid, etc., in addition to being bactericidal and with the advantage of containing only 0.1% sucrose (sugar), which, as is known, is the main cause of tooth decay". |

## DISCUSSION

Considering the rise of the health-related policies in the national territory [6], in the 'First Republic', the time dimensions denote the dissemination, to the regions of the country, of actions with a preventive focus, added to health campaigns, although far from empowerment of the subject [7]; subsequently, the so-called 'Vargas Era' was responsible for expanding campaign health actions; the 'Redemocratization Period' was marked by social movements that demanded

better conditions from the government in different aspects, including health; the 'Military Government' was marked by mass impoverishment, epidemics, individualistic and specialized health care, reduced investments in health; and 'The 80s' represents a symbolic and unforgettable time for health, when the Unified Health System (Sistema Único de Saúde, SUS) was proposed and, consequently, the concept and way of working in health were expanded [6].

Throughout history, the determinants of understanding dental caries have been linked to the different production and reproduction processes of human societies, in particular, current knowledge and the type of social organization. These conditions were able to promote explanatory models of the disease as well as to shape the health interventions developed by the public policies. The findings of this study show, in different ways, the evolutionary trajectory of knowledge about dental caries in Brazil, relating the etiological notion, preventive strategies and public policies in force in different historical periods.

The large number of publications aimed at preventive actions in the period of the First Republic confirms the dissemination of supposed benefits of the use of toothpastes, also reflecting their first commercial presentation in 1850, in the United States. However, it is worth noting that, at that time, preventive actions and products were benefits alluding to the economic capital of more favored social classes, in addition to having an individualistic character and strengthening the premise of single causality.

As for diet, the establishment of the caries-sugar relationship could be better identified in the course of the 20th century in classic studies in animals and humans, when many authors started to mention tooth decay as a sugar-dependent disease [8].

The first three decades of the 20th century in Brazil were marked by the beginning of industrialization and expansion of urbanization in the country, although concentrated in the Southeast region, which, in addition to changing the way and quality of life of the population and increasing social inequalities [9], culminated in individual and collective changes in dietary patterns, with strong inclusion of industrialized food products and with high carbohydrate contents. As shown in the excerpts, this set of changes reflected in the drastic increase in the caries rates in the entire population, and this condition was also confirmed in several industrialized countries, inducing the search for further explanations about oral diseases [9].

Internationally, the first evidence of the social determination of the health-disease process and the first state models of interference in the health of communities were outlined, namely: English public health and French social medicine and, specifically in the area of oral health, the American model entitled Incremental System, which later was followed by the Brazilian government [10]. State intervention, in this sense, occurred in 1929 with the creation of the School Dental Service [11], which started to use the strategy package of the American model of care for minorities, in an attempt to solve the Brazilian problems [10]. This service was characterized by individual dental care, merely curative, on demand and without planning, at the teaching sites themselves [12]. As portrayed, public policy makers believed that the provision of curative care would be able to reduce the prevalence of caries and improve children's oral health, with the future goal of conquering a generation of healthy adults.

The promotion of public policies in favor of the ideology of assistance to schoolchildren not only prevailed, but was also expanded in the 'Vargas Era'; in the full scope of dental care, they did not advance significantly, as collective health actions basically guided campaigns to control emerging diseases that affect man's productive capacity [6].

Great advances were achieved in the 1950s and 1960s, when the correlation between the increase in carious lesions and local factors, such as the quality of exposure to sucrose and the presence of microorganisms, was proven [12]. From this new knowledge, the dissemination of educational-preventive strategies based on these approaches becomes clear in the researched print media.

Studies carried out in the United States, in the 1940s, on the effectiveness of fluoride in reducing the prevalence of dental caries reflected in decision-making during the 'Redemocratization' period. The World Health Organization recognized, then, the importance of implementing and using fluorides at the population level, indicating it as an essential public health measure [13]. In Brazil, the milestone of that time was the implementation of the Special Public Health

Service (Serviço Especial de Saúde Pública, SESP), when provision of care to schoolchildren was expanded, also targeting prevention and health promotion actions [11], with topical and systematized application of fluorides. The findings of this study corroborate this assertion by evidencing the dissemination of this practice.

Additionally, from that moment on, methods and techniques of health planning and programming became part of the daily lives of dozens of Dentistry professionals in several regions of the country [14].

As for the etiology category, in this period, the publications focused on the importance of diet (which used to be rich in sucrose and low in vitamin D) and on aspects related to oral acidity and microbiology, supporting the single-cause explanation for disease onset. Despite being outdated today, this concept of cause and effect has been improved over the years, effectively contributing to the development of public policies on the subject and, consequently, to reducing the incidence of dental caries [15].

Advances in this category were verified in the interval that constitutes the period of the Military Dictatorship, now associated with systemic and external (environmental) factors. The prevention and public policy categories followed this conceptual evolution, with an indication of visits to dentists under a prophylactic approach and preventive health campaigns, showing a broader understanding of the processes related to dental caries. Despite advances in information about the conception of the disease and the multifactorial theory, they were not enough to fully elucidate the oral health-disease process in view of its complexity in the lives of populations. Health, disease and death are not limited to just organic, natural and objective evidence, but encompass both individual and collective experiences of each society in their determinants [16].

Despite the above, the military period shows growth in spending on dental care and maintains the reproduction of the biomedical, individualist, technical, curative and specialized model, still under strong influence from the United States of America [6,11]. This statement is reinforced by the results herein found, when the print media analyzed highlights the expansion of curative school dental care as a response to the alarming number of children affected by dental caries and its severity. A number of studies show that there is no direct relationship between the provision of surgical-restorative oral services and quality indicators of oral health, both in the child population [10,17] and among adults or aged individuals [10,18].

In view of this epidemiological reality and advances in etiological and preventive knowledge in oral health, the governments began to invest more heavily in the use and expansion of the geographic coverage of topical and systemic fluorides as a fundamental strategy for the prevention and control of tooth decay. Enacted in 1974, federal law No. 6,050 guarantees the implementation of fluoridation of public water supplies in all Brazilian municipalities with a water treatment plant [19].

Since then, the use of topical fluorides, through mouthwashes, has been implemented in school programs in several Brazilian states. However, this measure was not able to reduce the rates of dental caries in this population, as it suffers frequent interruptions due to the erratic attendance of students in schools or to problems with the functioning of school health units [20]. Thus, given the results of specific studies that proved the efficiency, efficacy and individual and collective effectiveness of this chemical element, there was dissemination of its use, in particular, through fluoride toothpaste [20].

The use of fluorides during the gestational period was mentioned in the findings, and the purpose of the practice was to positively help the pre-eruption phase; later, it was proven that the dental surfaces strongly associated with the presence of dental caries are materialized after the intrauterine period [21]. It is noted that such courses of action were essential for the development of research studies and, consequently, for the evolution in the field of Dentistry.

The 1980s brought greater State accountability to the unsatisfactory epidemiological results of dental caries across the country, with new programmatic options. Full Dentistry emphasized prevention and scheduled return for preventive maintenance; the Care Inversion Program prioritized the stabilization of the disease for further treatment; and Early Care aimed at providing preventive care from pregnancy to early childhood [18]. Although these models have strengthened the prevention logic and helped to improve the oral health condition of the assisted groups, none of them

was able to comply with universality, integrity and equality in oral health actions [17], which are guiding principles of the recently instituted Unified Health System (SUS) that are in force to this day.

However, despite being outdated today, the oral health policies of that period showed advances by instituting oral health strategies on a situational basis, to the detriment of health measures mirrored in other countries, which proved to be inefficient for Brazil. Throughout the years, and considering the restrictions and difficulties, the findings in the Dentistry area gradually added representativeness and drove new targets. Nowadays, despite the temporal change, the challenges still exist; however, integrity, universality, equality and empowerment of individuals in the health context demonstrate the future potential to be explored.

Regarding the limitations found in this study, in addition to the peculiarities of documentary analysis, it is highlighted that comprehending the relationships, causes and justifications that supported the understanding of the researched representations may have suffered interference both from social phenomena and epistemological aspects. In addition, the scarcity of previous research studies on the topic addressed was considered limiting for the deepening of some aspects of the discussion, highlighting the importance of complementary methods capable of contributing to the codification of the analyzed documents.

## CONCLUSION

The collected data evidence that the different representations of dental caries published by Jornal do Brasil were strongly influenced by the political, socioeconomic and cultural factors in force in each historical period.

It is possible to assert that Jornal do Brasil, between the end of the 19th century and the end of the 20th century, in its own way and by popularizing knowledge in the field of Dentistry, contributed to individual and collective subjects becoming aware of the causes and protective factors of dental cavity. Thus, it is plausible to think that portions of the literate population consumer of printed newspapers may have modulated certain health behaviors, since they were often warned about issues involving diet and oral health and their influence on dental caries.

### Collaborators

CB Fadel worked on the study design, data analysis and article writing.MA Hampf performed the collection, analysis and discussion of data. JA Leandro interpreted and deepened the results and, in partnership with CB Fadel and D Bordin, made the final critical review of the article. C Zanesco and JE Langoski worked on writing the article.

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