

Reasons for and consequences of tooth loss in adults and elderly people in Brazil: a qualitative metasynthesis

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Abstract *The objective was to analyze and systematize evidence reported in qualitative studies on the reasons and consequences of tooth loss in adults and elderly people in Brazil. A systematic review of the literature on qualitative research methods and a meta synthesis of the results were performed. The study population consisted of adults over 18 years of age and elderly people in Brazil. Searches were performed in the BVS, PubMed, Scopus, Web of Science, BBO, Embase, EBSCO and SciELO databases. The thematic synthesis identified 8 analytical themes regarding reasons for tooth loss and 3 analytical themes regarding consequences of tooth loss. Dental pain, care model, financial situation and desire for prosthetic rehabilitation were determining factors for extractions. There was recognition of negligence in oral care, and the naturalness of tooth loss was linked to old age. Missing teeth caused psychological and physiological impacts. It is imperative to verify whether the factors that cause tooth loss persist, and how much those factors influence decisions to extract teeth among current young and adult populations. It is necessary to change the care model through the inclusion and qualification of oral health care for the young and elderly adult populations; otherwise, the model of dental mutilation and the culture of edentulism will persist.*

Key words *Tooth loss, Adults, Elderly, Qualitative metasynthesis*

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Introduction

Despite the evolution of dentistry and method to prevent oral diseases, tooth loss is still a worrisome situation worldwide, especially in the adult and elderly populations. In Brazil, according to data from the last national epidemiological survey conducted in 2010, missing teeth corresponded to 45% and 92% of the components of the decayed, missing and filled teeth (DMFT) index, respectively, for these two age groups¹.

Studies with quantitative data on the high prevalence of missing teeth are found in the scientific literature and provide evidence of this situation^{2,3}. However, understanding the situations experienced by people in their daily life is better addressed with qualitative studies, which provide a deeper understanding of the perceptions, motivations, experiences and interpretations of individuals regarding the phenomena that affect their lives⁴⁻⁶.

Tooth loss causes a decrease in quality of life associated with functional impairments in chewing and phonation, and psychological and social changes, such as loss of self-esteem and social status. The prospect of oral rehabilitation contributes positively to a return to normality in terms of laughing, talking and enjoying eating⁷. However, the dissatisfaction of individuals with a removable prosthesis, especially when the device is instable and will not stay in place, can lead to frustration and delays in returning to an adequate social life and functional condition⁸. In this regard, the public health system must ensure interventions to prevent and control oral diseases, especially for people with compromised general health, ethnic minorities and people with low income⁹, and ensure that access to oral rehabilitation offered by the Unified Health System (UHS) is broad and of high quality⁸. To date, there are no studies in the national literature that summarize the Brazilian situation of tooth loss in adults and elderly individuals, analyzed from the point of view of qualitative research.

The guiding questions of this study were as follows: (1) What is the evidence, collected by qualitative studies, about the reasons for tooth loss in adults and elderly people in Brazil? (2) What is the meaning and impact of tooth loss on the lives of these people? Understanding the perceptions, circumstances and impacts of tooth loss in adults and elderly people is important for establishing prevention and treatment strategies for promoting the oral health of these population

groups and for adjusting the implementation of public oral health policies that exist in Brazil.

The objective of this study was to analyze and systematize the evidence collected by qualitative studies on the experiences of tooth loss in adults and elderly people in Brazil, considering the reasons for and consequences of tooth loss for these population groups.

Method

Design

This was a systematic review of qualitative studies that addressed tooth loss and the reasons for and consequences of tooth loss in the Brazilian adult and elderly populations, associated with the meta-synthesis of the results of these studies. A metasynthesis consists of the examination and rigorous interpretation of qualitative research and its findings, allowing the clarification of concepts, and standards and production of a new and integrative interpretation of individual investigations⁶.

Thematic synthesis was the method used, based on Thomas and Harden¹⁰, to gather primary studies that analyze the phenomena experienced by people from their point of view. The systematic literature review followed the guidelines of the ENTREQ Statement¹¹ (Supplementary Material 1, available at: <https://doi.org/10.48331/scielodata.32YFHD>).

Search strategy

An electronic search was performed in the BVS, PubMed, Scopus, Web of Science, BBO, Embase, EBSCO and SciELO databases between May and September 2020 and between March and April 2021. The second search period was strategic to include and update the retrieval of articles in the databases. A manual search of electronically retrieved articles was also performed to ensure that relevant studies were not lost, but no articles were added.

The search terms were “elderly”, “adults”, “tooth loss”, “loss of teeth”, “self-perception”, “edentulism”, “access to health services”, and “self-image” with the Boolean operator “OR”, combined with “qualitative research” using the Boolean operator “AND”. Health Sciences Descriptors (DeCS/MeSH) in Portuguese, English and Spanish in the Virtual Health Library¹² were used.

Selection criteria

The inclusion criteria applied to the studies were: primary studies with qualitative or mixed methods; Brazilian population aged 18 years or older; published in English, Portuguese, or Spanish, no time limit relative to the publication period. The exclusion criteria were as follows: quantitative research; population under 18 years of age; theses or dissertations; summaries of events; book chapter; editorials; language other than English, Portuguese, or Spanish.

In the identification stage, 2,176 articles were retrieved from the databases by three researchers (GC, GB and BU). The titles were placed in a word file, preserving the text formatting as an access link to the abstract and full text, and alphabetically organized in order to identify duplicated articles. Excluding duplicates, 1,182 articles remained, whose titles were evaluated and excluded those that identified a non-Brazilian population, those that studied population groups with diseases and conditions (such as diabetes, cancer and cleft lip and palate), literature reviews and one of the titles that appeared in two languages. From this first stage of screening, 269 articles remained. By evaluating the abstract, quantitative studies were excluded, studies focusing on topics such as prosthetic rehabilitation, obesity, nutritional status, and old age, leaving 99 studies to be analyzed in full text form.

Eligibility

After retrieving and reading the full texts (99), eligibility was based on the presence of answers to the research questions and quotations by the participants. However, at this stage, studies were found without approval from the Research Ethics Committee, lack of technical and scientific writing quality, absence of a qualitative method in the presentation of data, and in the analysis and interpretation of results, causing the exclusion of 79 studies. Then, 20 studies were chosen for the qualitative synthesis, which were further subjected to a methodological quality analysis using the JBI Critical Appraisal Checklist for Qualitative Research¹³. The Joanna Briggs Institute recommends that studies that meet the inclusion and exclusion criteria established in the research protocol should be evaluated considering methodological quality and the possibility of bias, both in the design and conduct of the study and in the analysis of results¹³. The option to apply the analysis at this stage is because the methodological

evaluation questions present in the questionnaire are basic for eligibility (Supplementary Material 2, available at: <https://doi.org/10.48331/scielodata.32YFHD>).

The search, selection and retrieval of primary studies were performed by two independent researchers (CG and GB) and reassessed by a third researcher with experience in qualitative research (BU). The evaluation of the quality of the studies was performed by three researchers (GB, LT and BU). The differences between the evaluators were resolved by consensus.

Data extraction, analysis and synthesis

The thematic synthesis method recommended by Thomas and Harden¹⁰ was used for data extraction and analysis. The synthesis consisted of three stages: free coding of the data line by line, organization of free codes into areas (descriptive themes), and development of analytical themes.

In the first stage, two independent researchers (GB and BU) read the 20 selected primary studies, identified by number, focusing on the quotations by the participants. The testimonials were extracted, line by line, into an Excel spreadsheet, totaling 369 entries (rows). Each dataset (row) was identified by the article number of origin.

Subsequently, one or more free codes (word or expression) representative of the meaning and content of the testimonials were applied to the left of each line. As each line identified the data source, it was possible to verify the consistency of the interpretation and perform debugging, which resulted in 355 lines.

This step was performed by two researchers (GB and BU), independently, and then reassessed together to seek a consensus, generating new free codes. As some testimonials could contain more than 1 code, there was a total of 546 codes, which, using the functionality of the application, could be adapted when there were duplicates of words with the same meaning (e.g., speech/phonation; chewing/to chew/manducation) and organized to verify the quantity of each code. Four codes were excluded because they were not related to the objectives of this study (hunger, general health, old age, and material comfort), and two were counted twice due to typing errors (access/access and neglect/neglect), resulting in 540 free codes.

The next stage consisted of establishing descriptive themes. The similarities and differences of the codes were analyzed, so that it was possible to group them into related themes, which

received new denominations, characterizing an inductive process. This stage was performed independently by the two researchers and subsequently completed by consensus (Supplementary Material 3, available at: <https://doi.org/10.48331/scielodata.32YFHD>).

Analytical themes are characterized by “going beyond the content of the original articles”¹⁰. Thus, in the third stage, the descriptive themes were organized to answer the research questions of this study, allowing the emergence of analytical themes.

Results

Qualitative assessment of the primary studies

All studies (20) answered the questions involving coherence between the stated philosophical perspective and the research methodology; between the research methodology and research objectives, the methods used to collect data, and the representation and analysis of the data. They were also in accordance with current ethics committee criteria, and the conclusions were derived from the analysis or interpretation of the data. About the statement locating the researcher culturally or theoretically, and the researcher’s influence on the research and vice versa, 15 studies did not answer these evaluation questions. In two studies the participants and their voices were not adequately represented. No study was excluded for the qualitative synthesis (Supplementary Material 2, available at: <https://doi.org/10.48331/scielodata.32YFHD>).

Figure 1 shows the diagram of the study selection route, which resulted in 20 articles for qualitative synthesis.

Characteristics of the primary studies

The analyzed studies were published between 2005 and 2019, mostly with participants of both sexes, except for 2 in which only women were included, totaling 606 individuals older than 18 years of age. Most studies were conducted in the South region ($n = 7$), followed by the Southeast ($n = 6$) and Northeast ($n = 5$); one of the studies did not report the origin of the participants. The methods of data collection and analysis were semistructured interviews and content analysis (Table 1).

The grouping of free codes into related areas resulted in 16 descriptive themes (Supplementary

Material 3, available at: <https://doi.org/10.48331/scielodata.32YFHD>), which were organized and graphically represented in five hierarchical dimensions, as shown in Figure 2.

The thematic synthesis defined eight ($n = 8$) analytical themes related to the reasons for tooth loss, as shown in Figure 3.

According to the studies analyzed, the predominant reasons for tooth loss in adults and elderly people are barriers to dental care: transportation challenges and financial issues¹⁴⁻²⁵ and neglect or lack of information necessary for better oral health^{14-24,26-29}. Many adults and elderly people understand and accept the need for extraction for the reasons cited and consider the use of prosthesis necessary to facilitate speech^{15,16,18-20,26,27,29-32} and chewing^{15,16,18,20,26,27,29-32}, even though they may have problems adjusting or adapting to such devices^{16,18-21,26,27,30,31}. Another impact is related to aesthetics^{14,17-21,27,29-33}, with extractions interfering with employment^{14,29,33} and causing feelings of sadness^{17,20,26}.

Pain, mainly of dental origin, was one of the determining factors for access to a dental service. The treatment option was often extraction – an intentional option for pain relief – because removal would not cause more problems^{14,15,19-22,25,26,30-33}.

The financial situation of people who needed dental treatment largely determined the option for tooth extraction because this procedure was accessible. If the oral needs presented by people demanded conservative treatments, such options were not feasible from the financial point of view because they existed only through private services^{14,18-22,24,25}.

However, the care model in the public sector exerted a marked influence on tooth loss, either because public dental services essentially only offered certain treatments^{14,15,17,18,28} or because the dental surgeon determined which procedure would be performed, disregarding information about and options for the patient^{18-20,22,24}.

The intentional use of a prosthesis, as a desire, was one of the factors that contributed to tooth loss in this population group. This use is motivated mainly by aesthetic reasons, an important milestone in life, for the status (symbol) it conferred to its bearers and the distinction in receiving an apparatus for an important occasion, such as marriage^{17,22,28}.

There is recognition of the neglect of oral care but also the naturalness of tooth loss, linked to old age, resulting in feelings of resignation^{15,16,20,26,28,30}. Fear of dental treatment can be attributed to painful personal or third-party

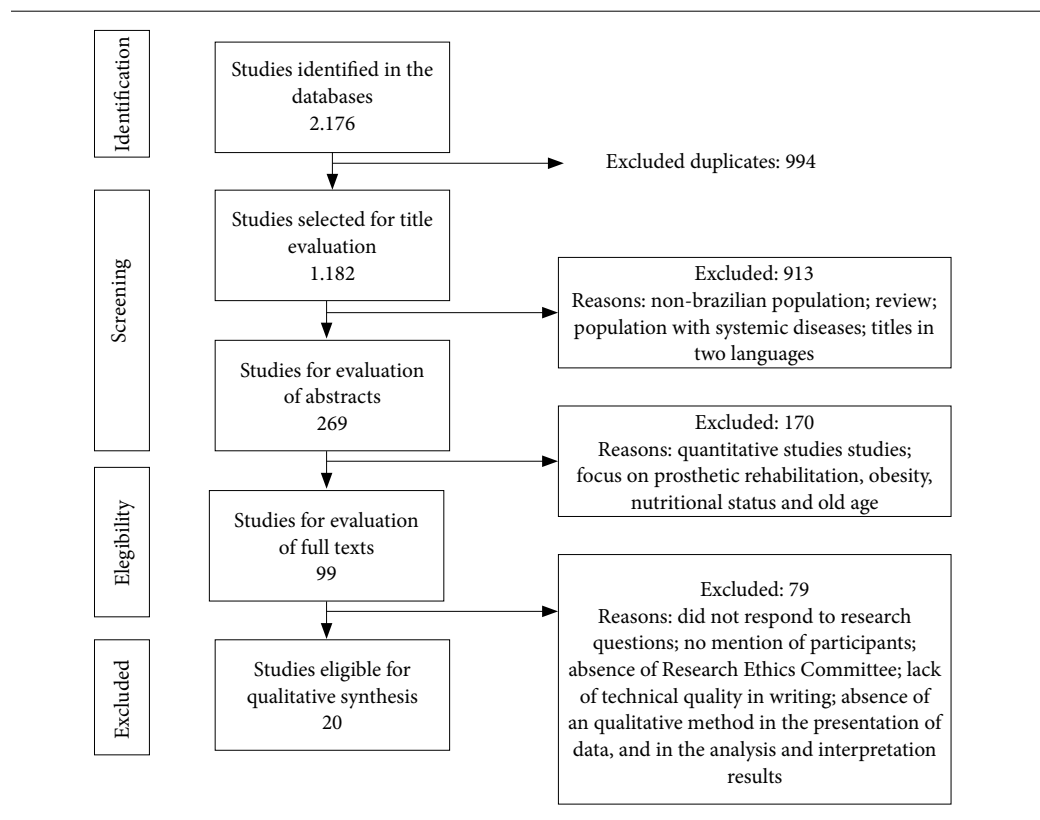


Figure 1. Flowchart for the inclusion of studies.

Source: Authors.

experiences coupled with a lack of information or even misinformation about oral health and dental treatment^{15,18,19,26,28}.

The consequences of tooth loss were summarized in three analytical themes and divided into subtopics, as shown in Figure 4.

The impact caused by tooth loss, observed in the studies, refers to the physiological repercussions caused by tooth loss related to chewing and phonation^{14-16,19,20,26,27,29-32}. Tooth loss also had an impact on the psychological aspects that manifest as sadness, shame, repulsion (relating to stigma and mutilation) relevant to appearance, affecting social and professional relationships, making it difficult to enter the labor market^{14,15,17,19,27,30,31-33}. In this regard, the apparent solution, through prosthetic rehabilitation, for many does not become a reality, as dissatisfactions persist mainly related to maladaptation, functional and/or aesthetic, which make chewing, phonation and aesthetics (smile) difficult^{16-21,26,28,30-33}.

Discussion

Using 20 qualitative studies on the subject, this study summarizes the reasons and consequences of tooth loss in adults and elderly people in Brazil.

The representation of descriptive themes configured the synthesis of studies related to tooth loss in adults and elderly (Figure 2). These themes do not directly address the answers to the research questions in this study, but they highlight important points about the phenomenon with regard to the meaning and impact, since both the reasons and the consequences of tooth loss are interposed in the dimensions represented by the descriptive themes. The analytical themes synthesized the answers to the research questions related to the experiences of tooth loss, which group access difficulties, deficiencies in public health services, lack of knowledge of forms of self-care, pain and mutilating practice, resignation in the face of oral

Table 1. Characteristics of the primary studies included in the analysis.

Author/Year	Participants	Age Range	Uf	Technique/ Data Collection Instrument	Data Analysis
Vargas AMD <i>et al.</i> (2005)	12 women 8 men	28 to 65 years	MG	Semi-structured interview	Thematic analysis
Ferreira AAA <i>et al.</i> (2006)	22 women 8 men	18 to 72 years	RN	Semi-structured interview	Thematic and lexical content analysis
Unfer B <i>et al.</i> (2006)	23 participants*	55 to 84 years	RS	Semi-structured interview	Discourse of the collective subject
Haikal DS <i>et al.</i> (2011)	18 women 12 men	61 to 80 and +	NI	Semi-structured interview	Content analysis
Bitencourt FV <i>et al.</i> (2019)	50 women 16 men	35 to 74 years	RS	Open interview	Content analysis
Fonseca, LLV <i>et al.</i> (2015)	15 women	29 to 50 years	MG	Semi-structured interview	Content analysis
Bortoli FR <i>et al.</i> (2017)	6 women	NI	SC	Semi-structured interview	NI
Souza e Silva ME <i>et al.</i> (2010)	9 women 4 men	37 to 73 years	MG	Interview	Content analysis
Lima de Paula LML <i>et al.</i> (2019)	7 women 4 men	Mean of 71.1 years	MG	Semi-structured interview	Content analysis
Corrêa HW <i>et al.</i> (2016)	52 women 18 men	35 to 74 years	RS	Semi-structured interview	Content analysis
Piuevezam, G <i>et al.</i> (2006)	36 women eand men	60 years and +	RN	Focus group	Content analysis
Moreira TP <i>et al.</i> (2007)	31 women and men	27 to 61 years	CE	Open ethnographic interview, participant observation	Hermeneutic-dialectic
Moimaz SAS <i>et al.</i> (2009)	3 women 2 men	68 to 77 years	SP	Semi-structured interview	Content analysis
Bulgarelli AF <i>et al.</i> (2012)	14 women and men	65 to 74 years	SP	Directed interview	Discourse analysis
Ferreira AAA <i>et al.</i> (2006)	22 women 8 men	18 to 66 years	RN	Interview	Thematic content analysis
De Marchi RJ <i>et al.</i> (2012)	23 women 18 men	64 to 84 years	RS	Focus groups	Grounded theory
Saintrain MVL <i>et al.</i> (2012)	50 women 22 men	60-79 years	CE	Semi-structured questionnaire	Content analysis
Reis SCG <i>et al.</i> (2006)	26 women 4 men	60-90 years	GO	Semi-structured interview, observation	Content analysis
Goulart MA <i>et al.</i> (2019)	23 women 18 men	60 years and +	RS	Focus groups	Thematic analysis
Klippel R <i>et al.</i> (2012)	14 women 8 men	60 to 80 years	PR	Interviews	Discourse of the collective subject

* No information about sex; NI: not informed.

Source: Authors.

diseases, beliefs and values, use of prosthesis as a solution or object of desire, financial difficulties, among others^{14-17,20,31,33}. In this way, it was possible to elaborate a conceptual model, adapted from Petersen³⁴ that summarizes these interrelation-

ships (Supplementary Material 4, available at: <https://doi.org/10.48331/scielodata.32YFHD>).

Sadness, shame, disgust, fear and resignation constituted the psychosocial dimension of the phenomenon studied, encompassing most of the

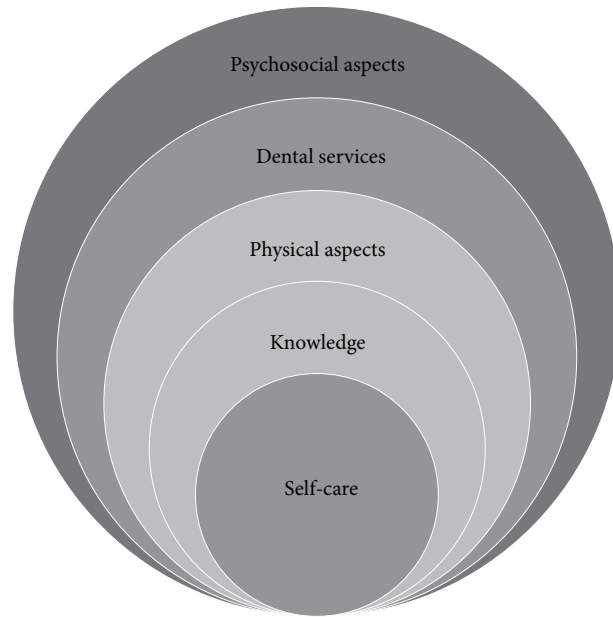


Figure 2. Diagram of the representative dimensions of the descriptive themes.

Source: Authors.

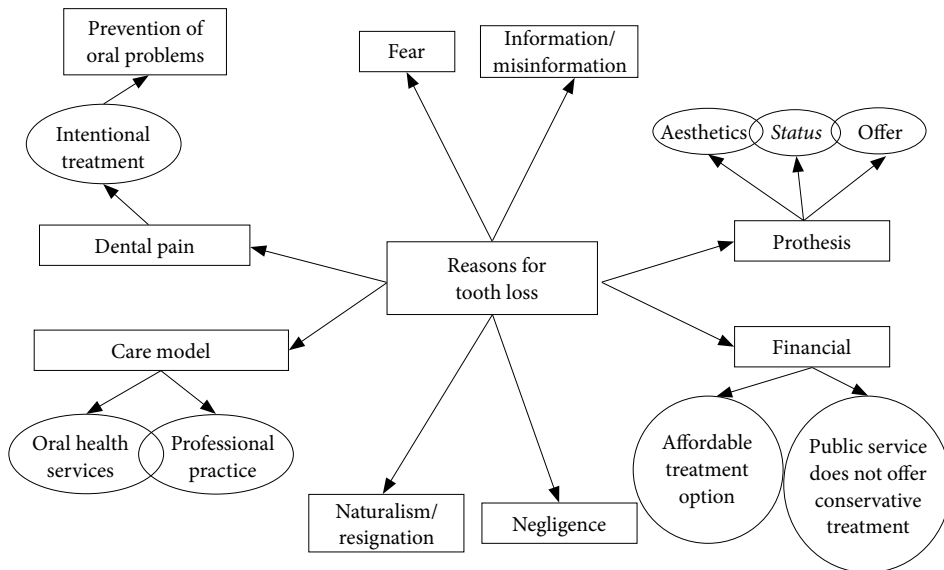


Figure 3. Analytical themes related to tooth loss defined by the thematic synthesis.

Note: connected circles indicate interactions between themes.

Source: Authors.

meanings and having a marked influence on the quality of life of these people³². The aspects related to dental services accentuated the difficulties

of access and a care model centered on mutilating practices²⁴, even though the principles of the Brazilian public health system include universal and

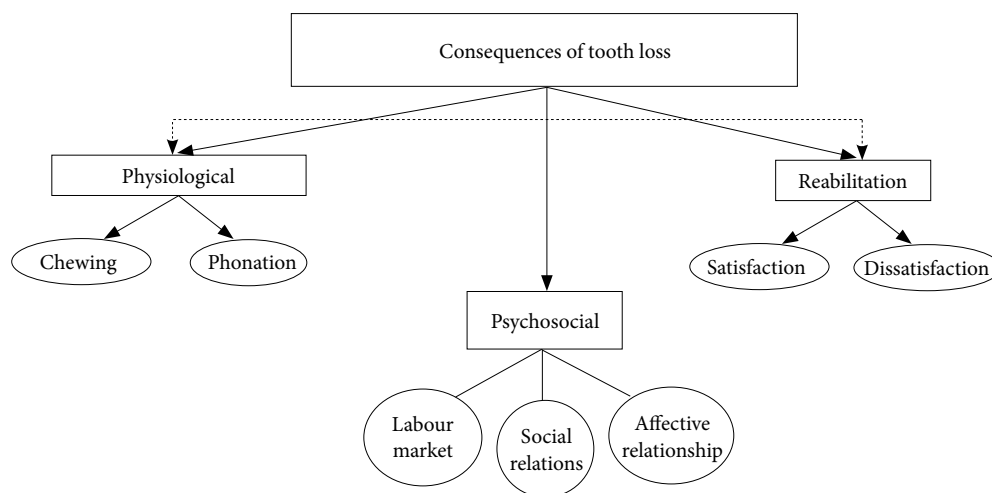


Figure 4. Analytical themes related to the consequences of tooth loss defined by the analytical synthesis.

Note: linked circles and dashed lines indicate interactions between themes.

Source: Authors.

comprehensive access and a focus on preventive activities, without prejudice to curative activities.

When examining edentulism rates and projecting the situation for the years 2020, 2030 and 2040 in Brazil, Cardoso *et al.*³⁵ state that edentulism is decreasing among young people and adults but will continue to increase in the coming decades among elderly individuals, and by 2040, among elderly individuals 86% will have edentulous arches. It is known that the elderly did not benefit from the fluoridation of public water supply and were exposed to a practice focused on extractions as a treatment for caries and periodontal disease³⁵. The data extracted in our study reflect that the dental area has faced challenges regarding the population's awareness of the importance of maintaining natural teeth and modifying the cultural perception that losing teeth is part of the aging process.

Social inequalities impact the oral health of individuals, resulting in the low use of dental services, little or no access to restorative procedures and the search for dental treatment mainly for pain treatment and dental extraction, in addition to another important factor in this scenario: low coverage and resolution of public sector dental services³⁶⁻⁴¹. Studies show that this sector should enhance its response capacity^{14,15,17,21,22,24-26,31} but do not show that the population demands qualified care through the UHS.

The impact of tooth loss strongly affects self-esteem, social and personal interactions, and employability, as oral health represents, to a greater extent, the personal and social relationships of people than the object of dental care. Regarding functional aspects, problems with diction, words and phonemes hinder communication and oral expressions, and a lack of teeth decreases the effectiveness of chewing and leads people to consume soft foods, limiting the nutrition obtained from food⁴². These changes can have consequences on the overall health of individuals, compromise the quality of life and independence of individuals and further burden the health system.

The role of market dentistry cannot be ignored, with the large supply of rehabilitation products promising recovery of the oral state, attractiveness and self-esteem on totally different bases from their natural condition^{22,43}. Although oral rehabilitation can potentially benefit individuals with regard to their social and professional lives^{7,25,42,44}, it does not guarantee full recovery, both aesthetic and functional, because some problems persist. In this sense, precarious dentition is not related to damage to health but to an "ugly" tooth: damage to aesthetics^{17,23,32}.

In some manifestations, edentulism can be perceived as something natural to fate and as pragmatic for dealing with a dental situation^{45,46},

potentially revealing the lowest priority for oral health in the face of a life context marked by general health issues and economic and social issues and highlighting the value of professionals who listen to patients and provide guidance on options for maintaining a healthy mouth and teeth⁴⁷, and who seek ways to deal with popular beliefs about oral health and dental care⁴⁸. Although dental procedures can be performed with equipment, materials and techniques that allow almost painless treatments and less discomfort, the image of the dental surgeon is still linked to pain and fear⁴⁵.

Until the prevalence of caries among young people and adults is effectively reduced, there will be a generation of elderly people requiring prosthetic rehabilitation. The oral needs of this population cannot be neglected⁴⁹.

Population aging has been increasing but continues to be accompanied by the phenomenon of edentulism³⁵. This review, which systematized evidence from qualitative method studies, emphasizing the multiple aspects involved in tooth loss, is added to the other evidence obtained by statistical analysis of the results¹⁻³. In qualitative research, the criteria of reliability, validity and generalization cannot be applied in the same way as in quantitative research, thus, the use of tools to assess the methodological quality of primary studies strengthens the levels of evidence in research. In this sense, and based on this review, it is suggested that the researcher declare his influence on the research based on his beliefs and values and on his relationship with the study participants, since in the qualitative method the researcher is the main instrument of research by observing actions and contexts and reasoning based on human perception and understanding⁴.

Regarding the limitations of this study, we emphasize that aspects related to gender, social class or educational level were not analyzed, and these questions can be used for future research. The synthesized interpretation of the phenomenon produced sustained evidence in the studies included in the analysis and showed similar experiences and perceptions, but it is possible that other researchers indicate a different theoretical model to explain the phenomenon studied in this meta-synthesis. However, we agree with the arguments of Dixon-Woods et al.⁵⁰ when they point out that this would also occur with researchers of primary qualitative data.

Final considerations

The thematic synthesis of the reasons for tooth loss in the adult and elderly population of Brazil showed that a combination of factors was responsible for the dental mutilations that occurred in these generations. A combination that involved the subjects in a social, economic, cultural and psychological context characteristic of the country in which they lived and live. In a context typical of public and private services and health policies of the country at the time. In other words, the decision of an individual and/or an oral health professional to extract teeth was surrounded by influences, of greater or lesser weights, all driving decision-making. Dental pain conditioned decisions and limited alternatives: without conservative treatment, relief is achieved through extraction, when popular self-care practices were not enough, and is a financially accessible option. What is important today is determining whether these same factors persist and how much they still influence the decisions of both individuals and professionals and public and private dental care services.

The experience of partial or total edentulism can generate a combination of factors that affect people's quality of life, associating the impairment of functions, such as phonation and chewing, with impairment in social and affective relationships and in the job market. And the possibility of prosthetic rehabilitation, achieved with some difficulty by some people, may not bring back the full capacity of the physiological performance of a natural dental arch.

Considering the perspective that there will be a population of adults and elderly individuals with significant tooth loss, it is necessary to radically change the care model for the population. This is not an inversion of priority care for children and adolescents but of the inclusion and qualification of oral health care for the young adult and adult populations today. Without this action, we will continue in a model of repetitive restorative, dental mutilation, and a culture of edentulism. When the goal of comprehensive health care is sought, services cannot disregard the psychological and social aspects that impact the quality of life of people, requiring the expansion of care beyond the use of material technologies and the consolidation of policies and social and economic factors that reduce the risk of diseases and injuries.

Collaborations

GFP Cortez worked on research design, database survey and study selection. GZ Barbosa worked in the database survey, in the selection of studies and in the analysis and interpretation of the results. LHN Tôrres collaborated in the analysis and interpretation of the results, in writing and revising the final version of the article. B Unfer worked on research design, database survey and study selection, analysis and interpretation of results, and writing and revision of the final version of the article.

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