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Prosthesis and oral hygiene of complete dental prosthesis users in Brazil: an integrative literature review

Higiene da prótese e oral de usuários de prótese total no Brasil: revisão integrativa da literatura

Higiene da prótesis y bucal de usuarios de prótesis dentales completas en Brasil: revisión integrativa de la literatura

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Abstract
Aim: To perform an integrative analysis of the most up to date scientific literature on attitudes towards dental prosthesis hygiene and oral hygiene in the elderly who use complete dentures in Brazil. *Methodology*: The bibliographic search was carried through the Scientific Electronic Library Online - SciELO and Google Scholar databases, using the following two combined controlled descriptors "oral hygiene", "complete prosthesis", "oral health", "geriatric dentistry" with the operator Boolean “AND”. Peer-reviewed research articles were included. The Cochrane Handbook guidelines were followed, when applicable. *Results*: The research resulted in finding 21 articles, of which 15 were excluded. The integrative review was structured with 6 articles for data extraction and critical and descriptive evaluation. *Conclusion*: The studies in this review suggested that elderly Brazilians have many oral health problems and a low level of knowledge about oral and prosthesis hygiene. An important gap in practical research was identified in the literature, with regard to oral care in elderly populations using complete dentures.
Keywords: Oral hygiene; Complete prosthesis; Oral health; Geriatric dentistry.

Resumo
Objetivo: Realizar uma análise integrativa da literatura científica mais atual sobre as atitudes frente à higiene da prótese e à higiene oral de idosos que usam prótese total no Brasil. *Metodologia*: Pesquisa bibliográfica realizada nas bases de dados Scientific Electronic Library Online – SciELO e Google Acadêmico, utilizando os descritores controlados "higiene bucal", "prótese total", "saúde bucal", "odontologia geriátrica", combinados dois a dois com o operador booleano “AND”. Foram incluídos artigos de pesquisa revisados por pares. As orientações do Cochrane Handbook foram seguidas, quando aplicáveis. *Resultados*: As pesquisas acumularam 21 artigos, dos quais 15 foram excluídos. A revisão integrativa foi estruturada com 6 artigos para extração de dados e avaliação crítica e descritiva. *Conclusão*: Os estudos desta revisão sugerem que os idosos brasileiros têm muitos problemas de saúde bucal e pouco conhecimento sobre higienização oral e de próteses. Foi identificada uma lacuna importante na literatura de pesquisas práticas sobre cuidados bucais em populações idosas usuárias de prótese total.
Palavras-chave: Higiene bucal; Prótese total; Saúde bucal; Odontologia geriátrica.

Resumen
Objetivo: realizar un análisis integrador de la literatura científica más actual sobre las actitudes hacia la higiene de la prótesis dental y la higiene bucal de ancianos portadores de prótesis completa en Brasil. *Metodología*: Investigación bibliográfica realizada en las bases de datos Scientific Electronic Library Online – SciELO y Google Scholar, utilizando los descriptores controlados "higiene bucal", "dentadura completa", "salud bucal", "odontología geriátrica", combinados dos a dos con el operador booleano "Y". Se incluyeron artículos de investigación revisados por pares. Se siguieron las pautas del Manual Cochrane cuando correspondía. *Resultados*: Las búsquedas acumularon 21 artículos, de los cuales 15 fueron excluidos. La revisión integradora se estructuró con 6 artículos para extracción de datos y evaluación crítica y descriptiva. *Conclusión*: Los estudios de esta revisión sugieren que los ancianos brasileños tienen muchos problemas de salud bucal y poco conocimiento sobre higiene bucal y prótesis dental. Se identificó un vacío importante en la literatura de investigación práctica sobre el cuidado bucal en poblaciones de ancianos con prótesis dentales completa.
Palabras clave: Higiene bucal; Dentadura completa; Salud bucal; Odontología geriátrica.

1. Introduction

Oral diseases such as caries and periodontal diseases are the main causes of tooth loss that has a cumulative effect during the course of life and places the elderly population at risk. This situation is relevant, considering the significant use of different types of dental prostheses by the above-mentioned population (Souza et al., 2017; Peron et al., 2022).

In Brazil, there is extremely high prevalence of tooth loss and edentulism. According to SB Brasil 2010, of the individuals between 65 and 74 years old, who were interviewed, only 7.3% did not need dental prostheses; and among those who needed prostheses, 15.4% needed a complete bimaxillary prostheses (Brasil. Ministério da Saúde, 2010).

Satisfactory complete dental prostheses can be defined as the type that offers patients comfort, allowing them to speak without impediments, chew food efficiently, have an adequate resting position, and provide a satisfactory esthetic appearance (Trentin et al., 2016; Techapiroontong et al., 2022).

The use of complete dental prostheses causes changes in the oral cavity of patients, resulting from changes in the oral microbiota, thus leading to a predisposition to periodontopathies and inflammatory processes in the mucosa. Therefore, these patients need to take greater care with oral hygiene, as a preventive strategy against these diseases (Tavares et al., 2016; Chan et al., 2021).

It is important to consider not only the damaging processes in the oral cavity resulting from the use of a complete prothesis, but also the diminished motor capacity of elderly prothesis wearers, which makes it difficult for them to perform effective oral hygiene. Knowledge about the oral health-disease process is important for elderly people, to enable them to clean the oral mucosa, alveolar ridge and dorsal surface of the tongue correctly. Thus, daily hygiene is essential, resulting in improvements not only in oral health, but creating the habit to perform oral hygiene daily (Rovida et al., 2016; Sá et al., 2019).

Unsatisfactory hygiene leads to the accumulation of plaque, pigments, dental calculus, and wear of the acrylic portion of the complete prosthesis. A large number of these complete dentures users are unable to carry out effective cleaning because their Dentist has not provided them with adequate guidance or they are not following the Dentist's recommendations (Tavares et al., 2016).

The hygiene method most used by prosthesis wearers is brushing their dentures with detergent, soap or toothpaste. Certain characteristics inherent to the prostheses allied to the patients' advanced age increase the difficulty of performing effective oral hygiene (Marra et al., 2017).

Adequate hygiene combined with good adaptation of the complete prosthesis are essential factors to ensure the physical and psychological well-being of patients who use them. Therefore, is extremely important for Dentists to instruct prosthesis users correctly about the various aspects of wearing dentures, thereby contributing to enhancing their oral health and quality of life (Nóbrega et al., 2016; Tuuliainen et al., 2020).

Thus, studies that assess the oral hygiene habits of prosthesis users are indispensable to that ensure that elderly

persons are given appropriate guidance about procedures for daily cleaning of the prosthetic appliance and the oral cavity (Nóbrega et al., 2016; Tuuliainen et al., 2020). The aim of this integrative review was to perform an integrative analysis of the most up to date scientific literature on attitudes towards prosthesis hygiene and oral hygiene in the elderly who use complete dentures in Brazil.

2. Methodology

The guidelines of the Cochrane Center (Cochrane Handbook 2019) were followed to conduct the present study, when applicable, and were adapted when the specificity of this integrative review was incompatible with that of systematic reviews. For the purpose of data extraction, the authors previously developed a data collection instrument. The bibliographic search took place in the period between April 5 and 20, 2020.

In order to formulate the guiding question, the authors considered that the signs of oral hygiene and of prosthesis reflected on oral health, therefore, the guiding question was “What has been the oral health condition of elderly users of complete prosthesis users in Brazil, during the last five years?” according to the criteria of the POT principle. (P) Population: elderly users of complete prosthesis in Brazil; (O) Outcome observation: quality of oral health based on oral and prosthesis hygiene; (T) Types of study: observational, descriptive, documentary, semi-experimental and clinical research. The data were collected from primary sources of information.

The bibliographic search was carried out in the Scientific Electronic Library Online - SciELO and Google Scholar databases, using the following two combined controlled descriptors "oral hygiene", "complete prosthesis", "oral health", "geriatric dentistry” with the operator Boolean “AND”.

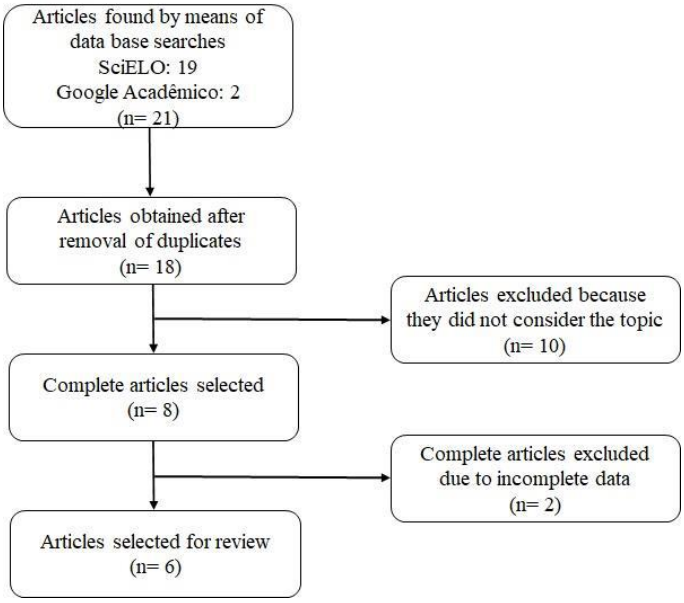
The inclusion criteria were: scientific research articles that covered the theme, published in Portuguese and English, with full availability, and published and indexed in the above-mentioned databases in the period from 2016 to 2020. Monographs, dissertations, thesis, gray literature, case reports and review articles were excluded. The articles were selected by two reviewers independently according to the established criteria and cases of disagreement between the reviewers were solved by consensus.

The choice of only two databases and two languages was justified by the intention to verify the development of the theme in Brazil. The period, between the years 2016 and 2020, was justified by the interest in the present demand on the subject.

Data extraction was performed by two reviewers, using an instrument previously developed for this purpose, containing the item headings: identification of the article (author and year of publication), periodical in which it was published, methodological characteristics of the study and conclusion. For description of the outcome, in spite of it being categorical, the number of individuals was not counted, only oral health conditions were reported, due to non-matching of the objectives between the articles. In the absence of explicit data, the imputation process was carried out with an unconditional average, using average value within the article itself.

Descriptive data analysis was performed, allowing the data to be observed, described and classified, in order to collect the knowledge produced on the topic addressed, as well as to identify the need for future investigations on the theme. The flowchart of bibliographic research and the study selection process is shown in Figure 1.

Figure 1 – Diagrammatic representation of literature search and article selection process.



Source: Authors.

3. Results

The sample of this study consisted of six articles, five in English and one in Portuguese and all six articles were published in national magazines. In the SciELO database, 19 articles were found and in Google Scholar only two articles. Table 1 represents the specifications for each of the articles.

Table 1 – Specification of articles selected for the integrative review (n=6), 2020.

	Database	Article Title	Languages	Type of Study	Authors	Periodical/Year
(1)	SciELO	The impact of hospitalization on periodontal health status: an observational study	English	Longitudinal observational	Lages VA, Dutra TTB, Lima ANAN, Mendes RF, Prado Júnior RR.	Rev. Gaúch. Odontol. / 2017
(2)	SciELO	Educational program in oral health for caregivers on the oral hygiene of dependent elders	English	Experimental, descriptive, observational	Lago JD, Fais LMG, Montandon AAB, Pinelli LAP.	Rev. odontol. UNESP / 2017
(3)	SciELO	The importance of hospital dentistry: oral health status in hospitalized patients	English	Clinical, observational, cross-sectional and not controlled	Amaral COF, Belon LMR, Silva EA, Nadai A, Amaral Filho MSP, Straiotzo FG.	Rev. Gaúch. Odontol. / 2018
(4)	Google Academic and SciELO	Oral health of elderly aged 80 years or older: condition, self-perception and use of dental services	Portuguese	Descriptive	Pauli TP, Figueiredo DR, Barbosa AR, Castro RG, Mello ALSF.	Rev. odontol. UNESP / 2018
(5)	SciELO	Hospital dentistry and the occurrence of pneumonia	English	Quasi experimental study	Gomes RFT, Castelo EF.	Rev. Gaúch. Odontol. / 2019
(6)	SciELO	Protocol for the evaluation of chewing among older adults	English	Quantitative, exploratory, descriptive, observational	Souza LFF, Silva LE, Scelza N.	Rev. bras. geriatr. gerontol. / 2019

Source: Authors.

Each selected study had the necessary data that contemplated at least one of the two purposes the authors intended to achieve by assessing oral health: oral hygiene and prosthesis hygiene, and these data were used to carry out. Table 2 shows the distribution of the data extracted according to the methodology used, results obtained in the research and conclusion.

Table 2 - Characterization of studies selected according to methodology, results and conclusion.

Article	Considerations	Methodology	Results	Conclusion
(1)	Conducted in the period between January and March 2011, at a private hospital in Teresina, Piauí, Brazil, with 41 hospitalized patients	Data of 41 patients, of whom approximately 14% were elderly, were collected by means of a questionnaire about oral hygiene habits; in two time intervals - on admission and on discharge; also, by clinical evaluation and measurement of periodontal index PSR at time intervals T0, T1 and T2 with intervals of five days between measurements.	Frequency of oral hygiene diminished (not any time per day T0= 0%, T2= 17.1%) for all groups. The periodontal index worsened (PSR 0 T0= 42.6%, T2= 14.3%) for all groups.	The periodontal condition of all hospitalized patients was aggravated over the course of time of hospitalization. This drew attention to the importance of oral health care in hospital
(2)	In a survey conducted at a long term residence institution in Araraquara, São Paulo, with 40 institutionalized older persons and with 14 caregivers.	Clinical evaluation of oral health and hygiene of 40 functionally dependent elderly persons (to guarantee oral hygiene performed exclusively by caregivers) in T0, T1, T2, T3 and T4 at six-monthly intervals divided into two years. Interview with 14 caregivers covering knowledge and doubts about implementation of oral care, and lecture offered monthly by a professional, about oral hygiene and care.	Of the 40 elderly persons 18 used complete dentures and there was positive development of the clinical variables researched from T0 to T4. There was positive development of the knowledge researched from T0 to T4.	The educational program for caregivers had positive impact on the oral health of elderly institutionalized persons, observed by the increase in efficacy of the oral health parameters, contributing to gain in knowledge of oral hygiene by the caregivers.
(3)	Conducted in a public hospital in Presidente Prudente, São Paulo, Brazil, with 103 hospitalized patients.	Data of 103 patients, of whom 24.3% (n= 25) were elderly, were collected, by means of interviews about oral hygiene and clinical evaluation covering aspects of tissues and teeth in the oral cavity.	In the group of elderly patients (≥65 years) 12.8% had goo oral conditions and 8.3% had excellent oral hygiene.	The quality of oral health and hygiene was considered insufficient.
(4)	Study conducted between 2011 and 2015, with 59 elderly persons, on home visits in regions selected in a municipality in Santa Catarina, SC, Brazil.	Data were collected by means of a questionnaire (Oral Health Impact Profile) applied to the interviewees during a home visit	2011 ✣ oral hygiene selfcare capacity 98.3 ✣ brushing prosthesis 2X p/day or more 56%. 2015 ✣ oral hygiene selfcare capacity 98.3 ✣ brushing prosthesis 2X p/day or more often 50%.	Reduction in care of oral health and dental prosthesis increased the need for some type of prosthesis.
(5)	Conducted in 2017, at a public hospital in a region in the South of Brazil, with 42 hospitalized elderly persons.	Group 1 – clinical evaluation of oral health and daily professional follow-up (data collected at the beginning and end of hospitalization) = 22 elderly persons Group 2 – clinical evaluation of oral health and provided with guidance about oral health and hygiene, without follow-up (data collected at the beginning and end of hospitalization) = 20 elderly persons	Group 1 ✣ beginning of hospitalization 21.4% good oral health conditions and oral hygiene; and 4.8% dental prostheses considered adequate ✣ end of hospitalization 26.2% good oral health conditions and oral hygiene; and 11.9% dental prostheses considered adequate. Group 2 ✣ beginning of hospitalization 19% good oral health conditions and	There were improvements in oral health in both groups, showing the importance of the Dentist's work with the hospitalized patients.

			oral hygiene; and 4.8% dental prostheses considered adequate ⁘ end of hospitalization 11.9% good oral health conditions and oral hygiene; and 14.3% dental prostheses considered adequate.	
(6)	Study conducted between 2015 and 2016, in a hospital school, with 53 elderly persons who were being followed-up at the hospital, in a municipality in the state of Rio de Janeiro, RJ, Brazil.	Data were collected by means of a questionnaire applied relative to oral perception and clinical evaluating covering the aspects of tissues and teeth in the oral cavity.	Self-perception of good oral health of 100%. Presence of 20 intact and functional teeth 30.2%. Well-adjusted prostheses in edentulous areas 28.3%. Tooth mobility 9.4% High level of compromise due to dental caries 22.6%.	The professional could not conclude the process of oral health analysis, relying exclusively on the self-perceived responses provided by the elderly persons themselves; the information provided was imprecise and incompatible with the clinical data.

Source: Authors.

In relation to the geographic distribution of the researchers analyzed, in the areas of the Brazilian territory, 50% (n = 3) were carried out in the Southeast (Lago et al., 2017; Amaral et al., 2018; Souza et al., 2019), 33.3% (n = 2) in the South (Pauli et al., 2018; Gomes & Castelo, 2019) and only 16.6 % (n = 1) in the Northeast region (Lages et al., 2017).

The majority of the selected articles (66.6%; n = 4) stated the location of data collection was in hospitals (Lages et al., 2017; Amaral et al., 2018; Gomes & Castelo, 2019; Souza et al., 2019). In relation to the other articles, one was carried out in a long-term institution (Lago et al., 2017) and another in selected rural and urban areas of a city, by home visits (Pauli et al., 2018).

4. Discussion

An integrative review enables a survey that is broader in scope, as it allows the inclusion of theoretical and empirical literature as well as studies with different methodological approaches (quantitative and qualitative), generating practical responses for the clinical and scientific community. Complications can be found, this is why guidance manuals are used, such as that of the Cochrane Center (Cochrane Handbook 2019), used in this review, to minimize errors, difficulties and bias, for example.

The bibliographic survey resulted in a low number of articles, 21 articles in total and six selected. With very specific objectives and a guiding question, the protocol for selecting articles in the databases was restrictive. Some filters, which limited the search, were used, such as language: limited to Portuguese and English; the place where the research was carried out, limited to Brazil; type of study, limited to research, and the filter period, which was limited to the years 2016 to 2019.

It was assumed that the Southeast of Brazil would have a higher number of studies (Lago et al., 2017; Amaral et al., 2018; Souza et al., 2019), due to having higher education institutions and postgraduate courses that conduct research (master's and doctorate), larger number of researchers and greater investment. This fact makes it difficult to compare the Brazilian regions and to outline the real needs of each region. The competent authorities responsible for oral health, more specifically of the elderly population using complete prosthesis, do not have any data on the quality of oral health, and are therefore, unable to outline adequate public health policies directed to this population.

In addition, there is no single protocol for assessing the quality of oral health. Each survey used different protocols that most satisfied its convenience. Using the same methodology for conducting the research, the data collected would be more compatible and more reliable for comparisons between regions in Brazil. It is important to highlight that collecting data for

planning public oral health policies was not among the objectives of this review, however all information collected will be relevant in the social sphere, and can help in decision making, not only for public policies, but also for clinical procedures.

In the articles analyzed, their researches were conducted with convenience samples, such as institutionalized elderly (long-stay places) and elderly population served and / or admitted to school hospitals. Research produced with convenience samples provides valuable data, but this type of sample is not representative, leaving questions about the validity of the data found, relative to a different population from the one that was studied.

In the articles reviewed, the larger portion of research was conducted in hospitals (Lages et al., 2017; Amaral et al., 2018; Gomes & Castelo, 2019; Souza et al., 2019), which may indicate that - except for the ease of working with a convenience sample - in the last four years there has been an effort to demonstrate the great importance of Hospital Dentistry, by generating data on oral health; and showing the extent of significance of Dentists' presence and performance in hospitals.

Among the selected studies, one was carried out in a long-term institution (Lago et al., 2017). These long-term institutions face many difficulties, such as financial, with family involvement in caring for the elderly, and in the time, availability and knowledge of employees. For the caregivers, a good education and guidance on health care and oral hygiene would increase the knowledge and supportive behavior of those who are primarily responsible for dental care of the elderly, and would promote better quality of oral health in this population.

Each study reviewed had its particularity, although they had two points in common, oral hygiene and oral health. However, it is important to note that there were various protocols for assessing the quality of oral health, populations of different socioeconomic conditions and other peculiarities of the study design of each research.

Oral health quality assessment data were collected using a self-administered questionnaire on the perception of oral hygiene (Pauli et al., 2018; Souza et al., 2019) and interviews conducted by a researcher (Lages et al., 2017; Lago et al., 2017; Amaral et al., 2018). In addition, clinical assessment (Amaral et al., 2018; Gomes & Castelo, 2019; Souza et al., 2019) was performed, in which some periodontal indexes were adopted (Lages et al., 2017). Nevertheless, irrespective of the type of data collection method used, whenever the patients/caregivers were provided with an explanation or guidance on oral hygiene and prosthesis cleaning, an improvement in oral health was observed in the outcome, indicating that elderly Brazilians did not have good hygiene or do not know about the topic, or were not motivated and encouraged to perform good oral and prosthesis hygiene. It points out the importance of encouraging self-care of hygiene, when possible, and continuing education in health, favoring the empowerment of the elderly.

An interesting aspect was observed between two studies carried out in hospitals. One was carried out in a public (Gomes & Castelo, 2019) and the other in a private hospital (Lages et al., 2017), and divergent results were obtained. The population of the public hospital had better oral health results than the private hospital population, highlighting the relevance and importance of the presence of a Dentist in the hospital environment (Lages et al., 2017; Amaral et al., 2018; Gomes & Castelo, 2019).

This integrative review was guided by the Cochrane Handbook (Cochrane Handbook 2019), whenever the criteria applied. Sometimes difficulties were encountered and even contradictions with the guidelines followed. Eventually there were failures, but it was possible to obtain important data on the quality of oral health of the elderly, situation relative to the complete prosthesis used by these elderly people or their need for use, and their knowledge about periodicity and correct implementation of oral hygiene. In addition, there were gaps in the current scientific literature regarding data on the oral health condition of the population in the North and Midwest regions of Brazil, and lack of research that tested options of techniques or strategies capable of improving the oral health conditions of the population.

5. Conclusion

The studies included in this integrative review suggested that elderly Brazilians have many oral health problems. The attitude of the elderly towards oral and prosthesis hygiene was inaction and with little knowledge, whether they were institutionalized or not, in hospital or in their habitual environment, in conditions to perform their own hygiene or if they needed the help of caregivers.

The attitude of elderly Brazilians towards oral and prosthesis hygiene should be guided and encouraged by professionals and caregivers. This can be achieved with education in oral care of caregivers and the elderly themselves, when possible, access to professional dental care, whether in a hospital or dental office environment and public policies aimed to provide care for this special group.

An important gap was identified in the literature consulted on practical research on oral care in elderly populations who use complete dental prothesis. In addition, no research was found in the North and Midwest regions. More research on contemporary oral and prosthetic hygiene practices and improvements in oral health conditions should be developed, particularly considering the regions where no scientific research has been conducted.

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