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Review Article

Secondary impacts of the COVID-19 pandemic on access to oral health: an integrative review

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ABSTRACT

The damage resulting from the pandemic will be lasting, at all levels of health care, with a strong influence on the use of dental services. This integrative review aims to identify the secondary impacts of covid-19 on access to oral health. Data were collected from SciELO, PubMed/Medline; BVS/Lilacs. The selection of studies initially occurred by reading the titles and abstracts, then selecting the articles that should be read in full. Snowball strategy was used from the selected studies. In total 388 studies were collected and 24 analyzed. After reading the texts in full, it was possible to observe that they are divided into themes: dental problems faced by users of health systems during the pandemic; immediate solutions to face the great demand for dental care; projections of public policy need for the future. Restrictions imposed on dental care had a negative impact on health services, mainly affecting the poorest segments of the population. Expanding access to dental treatments and water fluoridation are urgent measures that must be implemented, in addition to the application of public policies aimed at oral health. or, such as sitting time throughout the day, in addition to the importance to increase the physical activity pattern.

Keywords: Dentistry, Oral health, COVID-19, Access to health

INTRODUCTION

With its high transmission potential, pathogenicity and lethality, SARS-CoV-2 (COVID-19) has rapidly be-come a pandemic.[1-3] The World Health Organization (WHO) declared covid-19 pandemic on March 11, 2020. As of October 2023, more than 771 million people have been infected and more than 6.9 million deaths have been confirmed. According to the WHO, despite 13.5 billion doses of vaccine having been administered, the pandemic is still disrupting health systems around the world.[4]

To contain the alarming spread of the disease, measures such as social isolation and the suspension of non-essential activities were necessary for a long period of time.[5] It was necessary to reallocate physical/ financial/human resources for the treatment of those infected with COVID-19, in addition to paralyzing elective care, due to the large volume of patients in need of hospitalization.[6,7]

It's estimated that the damage will be long-lasting worldwide, at all levels of health care, whether due to the primary or secondary impacts of covid-19.[6,7] Primary impacts are those that are directly linked to the act of becoming ill. And secondary impacts are those related to the "effect of fear on the population, or as a consequence of the measures taken to contain and control the disease", that is, related to socio-cultural factors, access to health care, food and education; economic stability, employment and income; place of residence and the community in which the individual is inserted.[8] After two years of the pandemic, it is of the utmost importance that studies be carried out on the secondary impacts of the pandemic.

Dentistry was one of the areas that had a great secondary impact as a result of the pandemic, either due to the population's fear of being infected in the dental environment, it was observed that virus strains were identified in saliva up to 29 days after infection, in symptomatic and asymptomatic patients, or due to the paralysis of services, demonstrating that the pandemic had a strong influence on the use of dental services.[9-12]

Although a few weeks after the pandemic was declared by the WHO, dental practices were allowed to carry out emergency care, to avoid the aggravation of diseases and the need for hospitalization, self-medication was prevalent, causing cases of pre-existing diseases to be aggravated, leading to a high loss of dental elements.[13-15]

Based on the above, an integrative review was carried out to identify the secondary impacts of COVID-19 on access to oral health. In this study, access is defined as the use of health services at the right time.[16]

METHODS

This is an integrative review that consists of rigorously cataloging the existing bibliography on a given subject, based on a pre-established method, divided into the following stages: (i) elaboration of the review question; (ii) search and selection of primary studies; (iii) extraction of data from the studies; (iv) critical evaluation of the primary studies included in the review; (v) synthesis of the review results and (vi) presentation of the method.[15,16]

The review's guiding question was: "What are the secondary impacts of covid-19 on access to oral health?". Thus, data collection took place between March 24th to 30th 2022, and was carried out in the data-bases of: Scientific Electronic Library Online (SciELO); Web of Science and National Library of Medicine (PubMed/Medline); Virtual Health Library (BVS)/Latin American and Caribbean Literature on Health Sciences (Lilacs). The following descriptors were used to search for articles: "COVID-19" and "accessibility" and "oral health", and "COVID-19" and "access" and "oral health".

The inclusion criteria for selection were: a) articles published between January 2020 and March 2022, with studies that answered the guiding question; b) full texts in English, Portuguese and Spanish. Simple and expanded abstracts were not included; articles with paid access, since the articles on the subject were released for public access; unpublished manuscripts, since the results of these studies could not be known/identified. Articles found in more than one database were only counted once.

The studies were selected in three stages: first the titles were read; then the abstracts were read; finally, the articles that had to be read in full were selected. The snowball strategy was used based on the studies selected. Once the articles had been selected, an active search of the theoretical framework was carried out to find articles that had not been made available on the search sites. The selected articles made up the final sample of articles included in the review.

The research question was developed according to the PICO strategy, which establishes problem/situation, intervention, comparison/control and outcomes.[17] Thus: P-disease, I-administrative intervention, C-comparison with pre-pandemic and O-expected outcomes, such as economic impacts. After the search, all the articles identified were grouped and uploaded to the Mendeley Reference Manager software. Duplicate studies were recognized and removed by the software, according to the PRISMA flow, whose check-list was used in this research to assess the risk of bias, include and exclude studies. It also enables the use of automation to minimize the risk of duplicate articles. The development of QUADRAS was also applied to assess the quality of the studies included in the scope of this review.[18,19]

To interpret the results, the selected articles were sorted according to the objective, results and conclusion of each study. The articles were then grouped by similarity and categorized as follows: title, year of publication, authors and according to the data relating to the study (objective, type of study, methodology applied, results and recommendations).

RESULTS

A total of 382 articles were identified in the databases and six after the snowball strategy, giving a total of 388 studies. Of these, two were excluded due to duplication. Of the 386 articles that had their titles read, 48 were assigned to abstract reading. After reading the abstracts, 25 studies were selected using the PICO strategy and one was excluded because it did not meet the criteria for free full reading. Of the 24 articles selected for full reading, nine were published in 2020, 11 in 2021 and four in 2022. Figure 1 shows the study selection flowchart.

The majority of the studies were published in English (92%) and two (8%) in Spanish. The publications come from different countries such as Brazil, the United States, Canada, England, Scotland, Peru, Sri Lanka, Australia and Switzerland.

After a thorough reading of the texts, the following thematic categories were defined: the dental problems faced by health system users during the pandemic; immediate solutions to deal with the high demand for dental care; projections of public policy needs for the future.

DISCUSSION

The COVID-19 pandemic has been able to change the culture, politics, economy and, above all, the health of the population. The studies analyzed corroborate the

perception that the restrictions imposed on dental care have had and will have a negative impact on health services around the world, generating long waiting lines for care.

Furthermore, it mainly affects the poorest sections of the population, increasing inequalities and causing more oral problems such as cavities and periodontal disease, which will lead to economic problems for everyone involved. As the three thematic categories of this review explain.

Dental problems faced by health system users during the pandemic

With regard to dental problems, 10 studies dealt with this issue (Table 1). The studies were divided into one observational study, two quantitative studies, three retrospective studies and four cross-sectional studies.

Table 1: Authors discussing "Dental problems faced by health system users during the pandemic".

Author	Year	Objective	Type of study	Country
Lucena et al[20]	2020	Comparing the supply and use of oral health services in primary care, before and after the start of the covid-19 pandemic in Brazil	Observational	Brazil
Chisini et al[21]	2020	To describe the impact of the covid-19 pandemic on the pediatric dentistry treatments offered by the National Public Systems in Brazil.	Retrospective longitudinal ecological study	Brazil
Santos et al[22]	2021	Evaluate the number of dental procedures performed in the Unified Health System (SUS) during the first wave of covid-19 in Brazil (1st half of 2020) and compare it with the same period in 2019.	Retrospective longitudinal ecological study	Brazil
Nóbrega et al[23]	2021	To assess access to dental services in primary health care (PHC) in Paraíba between 2019 and 2020.	Quantitative research	Brazil
Eggmann et al[24]	2021	To assess whether the emergency department of a large Swiss dental institution faced different demands during lockdown	Retrospective longitudinal ecological study	Switzerland
Burgette et al[25]	2021	Assessing the degree to which children experience unmet need for dental care during the covid-19 pandemic and its association with pandemic-related housework or loss of income are unknown	Cross-sectional research	United States
Phadraig et al[26]	2021	Report on the international impact of the covid-19 lockdown on the provision of oral health care for people with disabilities before, during and after the first lockdown (March to July 2020)	Cross-sectional research	Ireland
Matsuyama et al[27]	2021	Investigating the association between worsening socioeconomic conditions due to the covid-19 pandemic and dental pain in Japan	Cross-sectional research	Japan
Wemyss et al[28]	2021	Investigate the health-related impact of patients on the path to orthognathic surgery, including those on the waiting list for surgery	Multicenter cross-sectional study	United Kingdom
Johnson et al[29]	2022	To explore the experiences of underserved populations and their community organizations in accessing oral health services and information in British Columbia and to identify their coping mechanisms employed during the reduction of oral health services	Quantitative research	United Kingdom

Three authors Lucena, Chisini and Santos specifically studied the Brazilian reality.[20-22] They identified that the supply and use of oral health services in primary care has decreased due to the COVID-19 pandemic, especially in pediatric treatments, endodontics and specialized surgery such as periodontal surgery. In view of the above, they propose increasing the supply of oral health services in primary care, with a focus on the most vulnerable children.

A study by Nóbrega, showed that, in general, first dental appointments and completed treatments showed a

vertiginous drop between 2019 and 2020, which can be attributed to the guidelines for suspending elective dental care during the COVID-19 pandemic.[23]

A study by Eggmann identified that the number of daily cases of abscesses, orthodontic emergencies and surgical follow-ups were more common during confinement, while the number of dentoalveolar lesions decreased.[24]

Two studies by Burgette and Phadraig emphasize the negative impact on dental care for people with disabilities and children, highlighting the need for non-traditional strategies such as tele-dentistry.[25,26]

A study by Matsuyama assessed that the worsening socioeconomic conditions due to the COVID-19 pandemic deteriorated the oral health of individuals.[27]

A study by Wemyss investigated the emotional distress of patients on the waiting list for orthognathic surgery, highlighting the psychological distress of dental patients with interrupted treatment, such as orthodontic appliance users.[28]

A study by Johnson found that patients with unmet dental needs resorted to coping mechanisms, including turning to community support or medical services, self-management of dental problems and not dealing with dental problems altogether.[29]

All the researchers emphasized the need for dental care even during the COVID-19 pandemic, at the risk of worsening diseases, with serious consequences such as tooth loss, an increase in comorbidities due to the worsening of pre-existing diseases and psychological suffering due to the lack of treatment.

The findings show that most oral diseases are subject to the social determinants of health. As well as the populations with the highest prevalence and risk of oral diseases, children, underprivileged populations, marginalized and vulnerable groups (such as the homeless) are precisely those who have the highest risk of developing chronic diseases and who are most vulnerable to COVID-19.[30]

However, with the restrictions on dental care, there has been an increase in the prescription of antibiotics and opioids as palliative treatment options for the dammed up need for surgery.[31]

In this way, multiple barriers to access to oral health are evidenced, such as cost, fear and dental phobia, denial of care, stigma and discrimination, even after reopening, which contributes to the exacerbated increase in oral diseases. This establishes the correlation between poverty and inequalities in dental care, highlighting the need to prioritize oral health.[32,33]

Immediate solutions to tackle the high demand for dental care

With regard to solutions, four studies were identified, one systematic review and three retrospective studies (Table 2).

Table 2: Authors debating "Immediate solutions to tackle the high demand for dental care".

Author	Year	Objective	Type of study	Country
Cunha et al[34]	2020	Documenting the impact of the novel coronavirus pandemic on the number of soft tissue biopsies performed in the Brazilian National Health System (SUS)	Retrospective longitudinal ecological study	Brazil
Chisini et al[35]	2021	Estimate the impact of the covid-19 pandemic on dental care procedures in Brazil's Unified Health System	Retrospective longitudinal ecological study	Brazil
Alsafwani et al[36]	2022	Evaluating the role of telemedicine consultations in pain management in patients with oral diseases	Retrospective study	United States
Aquilanti et al[37]	2020	Evaluate the feasibility of tele-dentistry in communities or home environments where the elderly live	Systematic review	Italy

Three studies by Cunha, Chisini, Alsafwani suggest the practice of Minimal Intervention Dentistry, primarily among the elderly and cancer patients, avoiding surgical interventions and preserving as much healthy biological tissue as possible throughout life. In addition to focusing on speeding up elective procedures, collective preventive actions such as smoking control, self-care and oral health prevention, with oral health monitoring for these groups.[34-36]

A study by Aquilanti, identified that the use of teleodontology immediately after reopening, to screen patients, was an effective way of minimizing damage and waiting times for care.[37] It speeds up the treatment of patients who are identified as having diseases that need more urgent care, such as oral cancer.

These studies corroborate the need to increase outpatient care and to reduce emergency care. This highlights the need to plan immediate actions to minimize waiting lines and ensure broad access to oral health. In addition to

encouraging greater attention to cancer patients whose treatments have been impaired and who need to return immediately. As well as the urgent investigation of new cases of oral cancer and the treatment of oral diseases through preventive consultations.

It is therefore necessary to look at the possibility of implementing measures such as the use of teleodontology for patient screening, monitoring schoolchildren, water fluoridation, oral hygiene instruction and the establishment of public policies for oral health.[38,39]

There was also a drop in dental appointments during the initial period of the pandemic. Even after the pandemic began, there was still a decrease of up to 20% in the number of dental consultations. This has a direct influence on emergency care, which grew during the first period of the pandemic.[12,40,41]

Projections of public policy needs for the future

With regard to projections for the future, 10 studies were selected: one data analysis, two literature reviews, one cross-sectional observational study, five quantitative studies, one rapid situational analysis and one retrospective study (Table 3).

Four studies by Brian, Lucena, Choi and O'Donnell emphasize that oral health should be included in policy considerations, ongoing research, monitoring, surveillance and other aspects of health.[42-45] This enables managers and health professionals to readjust dental care practices and routines. Although they foresee the need to increase the supply of services such as tooth extraction surgeries.

Table 3: Authors discussing "Projections of public policy needs for the future".

Author	Year	Objective	Type of study	Country
Brian et al[42]	2020	Show the importance of removing political, regulatory, workforce and reimbursement barriers and encouraging prevention	Data analysis	United States
Lucena et al[43]	2020	Comparing oral health access in primary care of the Brazilian National Health System (SUS), before and after the start of the covid-19 pandemic in Brazil	Observational	Brazil
Choi et al[44]	2021	Assess the impact of recent unemployment rates on insurance coverage and dental utilization	Quantitative research	United States
O'Donnell et al[45]	2022	Assessing access to dental care for high-risk patient groups in north-east and north Cumbria	Quantitative research	United Kingdom
Choi et al[46]	2021	Examining whether the rebound in procedure volumes in dental practices can be explained by county-level characteristics	Quantitative research	United States
Hopcraft et al[47]	2021	Investigating the impact of covid-19 on dental services provided in Australia through the Child Dental Benefits Schedule	Retrospective longitudinal ecological study	Australia
Stennett et al[48]	2022	Highlighting the potential impacts of the covid-19 pandemic on oral health inequalities in England in February 2021	Literature review	United Kingdom
Barca et al[49]	2020	To demonstrate the advantages of using telemedicine (TM) in the management of outpatients with oral and maxillofacial surgical pathologies during the covid-19 pandemic.	Quantitative research	Italy
Leon et al[50]	2020	Analyze and discuss the oral health situation of the elderly in these complex times that Chile and humanity are living through.	Literature review	Chile
Ratnasekera et al[51]	2020	Assessing the availability and accessibility of routine health services for cancer patients has been a concern during the covid-19 pandemic in Sri Lanka.	Rapid situational analysis	Siri Lanka

Other research by Choi, Hopcraft, Stennett highlights the need to guarantee post-pandemic dental care, reducing inequalities in oral health, especially for vulnerable populations and poorer areas.[46-48] Prioritizing long-term investments in public health programs to ensure greater access to oral health services. Emphasizing the preventive nature of the policies, but preparing the system for current needs such as the increase in chronic oral diseases and surgical needs.

Three studies by Barca, Léon, Ratnasekera suggest the systematic adoption of teleodontology to improve accessibility, especially for cancer patients, and to

facilitate the diagnosis of dental pathologies.[49-51] It also includes telephone consultations to monitor the health of these patients. Making it easier for patients to navigate the healthcare system to ensure that they can continue to receive timely treatment was the most critical aspect of the intervention.

These studies seek to analyze the possibilities and demands that will be faced by health systems in the near future, demonstrating the need for systems to be readjusted to cope with the great demand from patients whose care has been dammed up, highlighting the possibility of a regression in the epidemiological picture.

Thus, it can be concluded that studies show that, in a few months, health systems will begin to receive patients with health compromised by untreated chronic diseases, including oral diseases that can quickly deteriorate the health and quality of life of the subjects, warning of the need for the elderly to have their needs met more quickly to prevent oral diseases from affecting pre-existing comorbidities.[52,53]

We therefore propose the establishment of new public policies to guarantee the health of minority and more vulnerable socio-economic groups, as well as a restructuring of oral health, especially with preventive actions such as water fluoridation. Oral diseases should also be treated as chronic diseases and should have the same relevance as underlying diseases such as diabetes, obesity and cardiovascular diseases. Treatments should not be standardized, and the population's "habits, customs and beliefs" should be taken into account, as well as all the socio-economic and cultural issues involved in each society.[5,13]

CONCLUSION

Dentistry should be seen as one of the priorities for health care, with more work teams and better quality of service. It is not enough just to assess the current scenario of the COVID-19 pandemic. There is an urgent need to understand how health systems actually work in periods of normality and what their response capacity is on a day-to-day basis and in times of crisis, as well as the response and adaptation capacity of the professionals who work in them. This study has limitations. Not all databases were included, and only articles that dealt with access to oral health during a limited period of the covid-19 pandemic were included in the scope. It is therefore recommended that further research be carried out into the secondary impacts of covid-19 on oral health. However, the results obtained in this integrative review demonstrate the need to expand access to dental treatment and water fluoridation. These are urgent measures that must be taken by the state, by formulating and guaranteeing the implementation of public policies that ensure the right to access oral health services.

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