

Adaptations in dental public health services during the COVID-19 pandemic in municipalities of Southern Brazil: a grounded theory and collaborative research

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ABSTRACT

The aim of this study was to analyze oral health actions in four municipalities in Brazil during the COVID-19 pandemic according to a theoretical framework model on oral healthcare management. It was a qualitative study carried out in two stages. A theoretical-empirical model on the significance of oral healthcare management was developed, following the Grounded Theory method. Fourteen dentists and five healthcare managers participated, through open interview. Subsequently, collaborative research was performed, and the model was applied to analyze the documents produced to address the pandemic by each of four municipalities in Santa Catarina State. The model provided a framework for analyzing actions for coping with the pandemic regarding oral health services. Actions were identified in all dimensions of the model: reduction in supply of dental care due to restricted access to elective services; search for biosafety care standards; dissemination of standardized science-based guidelines; attempt to maintain comprehensive dental assistance through re-adaptation of specialized services and collective actions; and relocation of oral health professionals to assist in other sectors. The oral health care management framework can serve as a reference for redesigning oral health actions and services in other municipalities during the COVID-19 pandemic, in a broader perspective.

Keywords: oral health - health services administration - primary health care.

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RESUMO

Analisar as ações de saúde bucal em quatro municípios brasileiros durante a pandemia de COVID-19, segundo um modelo de referencial teórico sobre gestão da atenção à saúde bucal. Estudo qualitativo realizado em dois momentos. Foi desenvolvido um modelo teórico-empírico sobre o significado da gestão do cuidado em saúde bucal, seguindo o método da Teoria Fundamentada nos Dados. Participaram 14 dentistas e cinco gestores de saúde, por meio de entrevista aberta. Posteriormente, no segundo momento, foi realizada uma pesquisa colaborativa, e o modelo foi aplicado para analisar os documentos produzidos em cada município para o enfrentamento local da pandemia, em quatro municípios do Estado de Santa Catarina, sul do Brasil. O modelo forneceu uma estrutura para analisar as ações de enfrentamento da pandemia nos serviços de saúde bucal. Foram identificadas ações em todas as dimensões do modelo: redução da oferta de atendimento odontológico devido à restrição de acesso aos serviços eletivos; a busca por padrões de assistência à biossegurança; disseminação de diretrizes padronizadas e com base científica; a tentativa de manter a assistência odontológica integral por meio da readaptação de serviços especializados e ações coletivas; e realocação de profissionais de saúde bucal para atendimento em outros setores. O referencial de gestão da atenção à saúde bucal pode servir de referência para redesenhar as ações e serviços de saúde bucal em outros municípios em período de pandemia de COVID-19, em uma perspectiva mais ampla.

Palavras-chave: saúde bucal - administração de serviços de saúde - atenção primária à saúde.



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INTRODUCTION

The organization and provision of oral health services, dental education courses and the industry in this field have suffered a direct impact related to the COVID-19 pandemic¹⁻³. In oral healthcare environments, the Sars-Cov-2 virus can be transmitted directly through inhalation or exposure of mucous membranes to infected droplets, or indirectly via contaminated surfaces⁴. Direct or indirect transmission, and the fact that a considerable number of asymptomatic individuals can spread the virus, mean that aerosols are generated in environments where dental procedures are performed. The high risk of disease transmission in these locations is already known⁵. The possibility of cross-infection between oral health professionals and patients therefore requires the adoption of strict infection control protocols^{1,6}. With regard to this issue, academic texts (articles, guidelines) and government regulations have been published, compiling recommendations for biosafety in oral healthcare services^{5,7-11} in order to guide healthcare managers and professionals working in public and private oral health services, mostly aiming to address the pandemic and maintain the continuity of oral health services. In Brazil, technical note 04/2020 of the National Health Surveillance Agency⁹ was published and updated, providing guidelines for dentists and other healthcare professionals in relation to preventive measures and infection control in oral healthcare services.

The reorganization of so many actions and services in the oral healthcare system involves challenges to public administration¹²⁻¹⁶. At the beginning of the pandemic, there was a drastic reduction in access to oral healthcare services due to suspension of elective care and the restriction of healthcare procedures to emergency care¹⁷. In this context, healthcare management must be viewed as a reference for the availability and provision of health technologies according to demand, considering individual, family, professional, organizational, systemic, and societal dimensions¹⁸. Thus, the effectiveness of healthcare management requires a system that acts on situations that increase people's risk or vulnerability to diseases and illnesses. In oral health, efforts have been made to ensure a broader approach to oral health problems, seeking to overcome the hegemonic model of care, which has failed to establish comprehensive care for the population¹⁹⁻²¹. It is therefore relevant to investigate the possibilities

of public services to provide proper oral healthcare management and the limitations involved. It is equally important to evaluate the losses suffered by the population, oral healthcare professionals, and the system, when such public services are inadequate. Few studies have been published on coping with the COVID-19 pandemic from the perspective of oral healthcare management in Brazilian patients. The objective of this study was to analyze the actions carried out in the scope of oral health care during the COVID-19 pandemic in the municipal context, based on a theoretical-empirical model on the significance of oral healthcare management.

MATERIALS AND METHODS

This was a cross-sectional study with a qualitative approach, carried out in two stages. The first stage dealt with the development of a theoretical-empirical model on the significance of oral healthcare management, based on the Grounded Theory method (GTM), in the Straussian perspective²². In the second stage, collaborative research²³⁻²⁵ was carried out in partnership with stakeholders in the conduction phases (data collection and analysis) and dissemination of results²⁴, in which the model on oral healthcare management was applied with documentary analysis of the records produced and released regarding local actions taken to address the COVID-19 pandemic.

The theoretical model was developed through GTM in the context of Primary Healthcare (PHC) services in three municipalities in the state of Santa Catarina (Florianópolis, Biguaçu and São José) which have oral health teams at this level of care. The municipalities and participants were selected intentionally and for convenience. Health professionals with experience and knowledge in oral health care management were invited to participate in the composition of sample groups. The first sample group consisted of 14 professionals from the PHC oral health team (dentists, oral health technicians, and oral health assistants), and the second group consisted of five municipal health managers, totaling 19 participants.

In the second stage (Collaborative research), oral healthcare managers from four municipalities in Santa Catarina (Joinville, Lages, Rio do Sul, and Araquari) were selected intentionally and for convenience. They were contacted and invited to

participate in the study. Four managers joined, one from each municipality, all women, with extensive experience in oral health management. Table 1 presents information on each municipality.

To develop the theoretical model, data were collected through semi-structured interviews conducted by a single researcher with individual participants from November 2018 to April 2019, at a time and place chosen by the participant. The interviews were digitally recorded, and stored in MP3 format for subsequent transcription in Word, Microsoft® software.

To collect data on the actions taken, each manager listed the relevant documents from their municipalities, available in the public domain, which had been prepared from March to August 2020 to address the COVID-19 pandemic, including decrees, technical notes, and resolutions, among others. As inclusion criteria, texts that addressed any aspect related to the reorganization and re-adaptation of oral healthcare actions and services, including management and professional performance, were considered.

Following the GTM framework, interview data were collected and analyzed concurrently. Structured systematic analysis²² was performed using the coding strategy (open, axial, and selective). In the open coding, a detailed analysis of the textual material was initiated, selecting information representative of the characteristics of the content, followed by grouping codes according to similarity. In the axial coding, conceptual categories were identified by compiling codes of the same property and dimension. Selectively, codes that did not respond to the objective of the study were disregarded. In the

next phase, relationships were established among the categories, considering the components of the Strauss and Corbin paradigmatic model²⁶: context, cause, intervening conditions, action strategies and consequence. Based on the orderly integration of the categories and referencing the scientific literature, the theoretical-empirical model on the significance of oral healthcare management was developed.

In the second stage, the model served as a reference for document analysis. The text of the documents from each municipality was analyzed individually by its respective collaborating manager, who was also in charge of filling out the data in a spreadsheet. A virtual meeting was held to standardize the analysis strategies with all participating researchers. A Microsoft Excel® spreadsheet was prepared, containing the categories of the theoretical model in the rows, distributed among each of the components, and the municipalities in the columns, resulting in cells for filling in the excerpts of the documents. Then, one of the authors (the study coordinator) proceeded to the Content Analysis stage. The excerpts were coded²⁷ and grouped by similarity for each municipality. At the end, all the information was gathered in a final column, discarding repeated or very similar codes, combining data from all four municipalities. For confirmation, adjustments, and final consensus, a second virtual meeting was held, at which the data analysis stage ended.

The study followed the guidelines and provisions of Resolution No. 466/12. The project was referred to the Human Research Ethics Committee of the Federal University of Santa Catarina (UFSC), and submitted to evaluation by the municipal entities involved. It was approved under number 1.789.874

Table 1. Characteristics of municipalities participating in Stages 1 and 2 regarding population, dentists in PHC, availability of oral health services and oral health coverage. 2020

	Stage 1			Stage 2			
	FLN	BIG	SJO	ARA	RSL	LAG	JVL
Estimated Population 2020	508,826	69,486	242,927	39,524	71,061	157,544	597,658
Dentists in PHC	76	19	50	8	21	38	118
Dentists in specialized and emergency services	27	16	18	0	17	24	37
Health centers under municipal management with oral health service	53	13	27	6	17	21	45
% Oral health coverage (Aug 2020)	30	53	24	41	66	85	27
PHC: Primary Health Care; FLN: Florianópolis City; BIG: Biguaçu City; SJO: São José City; ARA: Araquari City; RSL: Rio do Sul City; LAG: Lages City; JVL: Joinville City. Source: Research data.							

(CAAE 59833916.1.0000.0121). Participants provided informed written consent, which was kept by the authors.

RESULTS

As a result of the first stage of the study, the theoretical-empirical model on oral healthcare management was composed of ten analytical categories, divided into five dimensions (Table 2). The model points to the meaning of oral health care

Table 2. Oral healthcare management in coping with the pandemic of COVID-19: examples of Codes according to the Dimension and Category of the Analytical Model. Santa Catarina, 2020.

Dimension	Category	Code Examples
Context	Observing BPHS principles	State / government actions to address the pandemic. Compromise of comprehensive health care. Suspension of actions and services due to the risk of contamination. Limitation of access to healthcare services. Offer restriction for urgent and emergency actions only.
Cause	Inserting oral health in primary care and the role of public managers	Search for technical and scientific information to minimize the impact of the pandemic in relation to the health of professionals and users. Integration of oral healthcare with other areas in PHC. Creation of protocols with service flows. Verification of the peripheral role of dentistry when analyzing the Technical Notes and guidelines. Lack of integration of oral healthcare management at the federal, state, or municipal level. Provision of the necessary resources related to the biosafety of healthcare. The need to adapt the offices and physical spaces of healthcare clinics. Development of strategies for training PHC oral healthcare professionals.
Intervening Conditions	Promoting interdisciplinarity	There was a greater integration of oral healthcare professionals (OHP) with the rest of the healthcare team. OHP trained to support and perform screening in healthcare clinics. OHP contribute to monitoring suspected or confirmed cases of COVID-19. OHP actively participate in admittance and guidance of users. Meetings with managers to reorganize the work process. Participation of dentists in the COVID-19 screening center.
	Integrating teaching and service	Absence of teaching-service integration in smaller municipalities. Internships in healthcare clinics suspended without expected return. The interactions between professors, tutors, and students became virtual through use of communication and information technologies.
Action Strategies	Listening to the user	The meetings of the municipal health council became virtual. Institution of an emergency council composed of representatives of the executive, the legislature, and civil society.
	Ensuring access to oral healthcare	Elective dental care suspended or restricted. Decrease in the offer of vacancies to ensure less flow of patients at healthcare clinics. Care restricted to pregnant women and emergency care for patients with chronic illnesses. The municipality follows the guidelines of the Ministry of Health (MH) and the State Health Secretariat (SHS). Reduction in the number of oral healthcare professionals through dismissal of those belonging to a risk group. Healthcare clinics extend hours of service, assigning work shifts to the teams. Emergency Care Unit with dental care 24 hours a day and seven days a week.
	Monitoring oral health indicators	Oral health indicators continue to be monitored using existing information systems. MH and SHS stated in a note that the transfer of funds to oral healthcare services (PHC, RDPL and DSC) will not be affected due to the reduction / suspension of services. Creation of a commission to adapt and improve the electronic production data management system.

Consequences	Organizing the work process	Professionals from risk groups, symptomatic, or those who tested positive for COVID-19 were removed by granting vacation, leave, or work from home. Changes in biosafety issues required adjustments to the offices, patient screening, alignment with the reception team and use of electronic tools. Creation of protocols for the organization of oral healthcare. The number and time of consultations were modified considering the structure and quantity of equipment and the time required for aerosol sedimentation and disinfection of the environment. Assistance was concentrated to make up for the lack of dental equipment and PPE for all professionals.
	Integrating health promotion, education, prevention, assistance, and rehabilitation actions	Educational materials were developed to be shared on social networks. Guidance on dental care and the importance of oral hygiene during the pandemic period. The actions of promotion, education and prevention for oral health care were impaired due to the halt in the activities of the Health at School Program. Delivery of toothbrushes, toothpaste, and folders with oral hygiene guidelines to the students at the municipal schools where classes were suspended. Home visits were restricted to the active search for pregnant women. Educational actions with the group of pregnant women were maintained through virtual means.
	Performing actions in the field of dentistry	The professionals carried out distance training on the topic of Minimal Intervention in Dentistry. Urgent care remains with minimally invasive procedures. Aerosol-generating procedures are scheduled for specific days. The attendance at the DSCs was initially suspended and the resumption was gradual, with a reduction in the number of consultations. Return of the most needed referrals to the RDPL. The biopsy service continued throughout the period. Care for hospital-level surgeries for special patients was maintained.

RDPL=Regional Dental Prosthesis Laboratory; PPE=Personal Protective Equipment; MH=Ministry of Health; DSC=Dental Specialty Center; PHC=Primary Health Care; OH=Oral Health; OHP=Oral Health Professionals; SHS=State Health Secretariat; ECU=Emergency Care Unit.
Source: Data produced by the study from document sources.

management as the guarantee of comprehensive care for the population, presenting as action strategies the following: guaranteed access, monitoring of indicators and listening to users. Interdisciplinarity and teaching-service integration are conditions that intervene in the qualification of healthcare. Although they present a significance that is consistent with the care model recommended by the Brazilian Public Health System (BPHS), in practical terms, actions remained focused on a traditional, individual, clinical-curative approach. In this case, the participation of professionals and users in decision-making is limited. The imbalance between the availability of professionals and the high demand for oral health care prevents its management to be fully exercised in practice. Even though oral health professionals are aware of the importance of actions to promote oral health, and thereby quality of life and disease prevention, from a collective perspective, they assign minimum space to them in their routine. Table 2 also summarizes the findings of the main codes that represent actions in the field of oral healthcare

undertaken to address the COVID-19 pandemic. The results are reported below to explain the integration of the analytical categories of the model with the content resulting from the study documents.

The context of oral healthcare management: observing BPHS principles

The model presented identifies the observance of the fundamental doctrinal and organizational principles of BPHS, while pointing out certain difficulties faced in putting them into practice, reflecting a conflict between intentionality and realities in the organization of oral healthcare. It recognizes the guarantee of comprehensive oral healthcare, with continuity in actions and services, scope (promotional, preventive, curative, and rehabilitation), both individual and collective, as well as coordination among the levels of healthcare. It also highlights interdisciplinarity, healthcare provision, bonding, humanization, health surveillance, and intersectionality as necessary strategies for oral healthcare management.

This background is also supported by the content of the documents analyzed, as they seek to respond to the impacts of the pandemic based on these fundamental principles. Recognition of these principles is maintained, with emphasis on the suspension of elective dental care at the primary, secondary, and tertiary levels and collective actions for oral health, as well as the limitation to emergency care as events that compromise users' access and comprehensive care.

The documents reveal the local efforts necessary to adapt and reorganize oral healthcare services, so that they may contribute to coping with the pandemic, maintain urgent care, and gradually return to healthcare in the safest way, according to each new epidemiological situation.

The insertion of oral health care in primary care and the role of managers

Oral healthcare management is shaped by the actions and services coordinated by the PHC. The profile of the oral health manager and the mechanisms for financing oral health via financial incentives are factors that directly influence oral healthcare management. Also noteworthy are political interventions, incomplete health teams, lack of physical infrastructure, targeting preventive actions solely to teams working in the Family Health Strategy (FHS), and focusing on the production of clinical procedures to the detriment of oral health promotion actions.

In the context of the pandemic, new challenges have arisen in the management of oral health care. Technical and scientific information was sought to minimize unwanted effects on the health of users and professionals. An adaptation of the physical structures of the clinics in the Health Center (HC) was developed, as well as greater integration and support of the oral health teams with the medical/nursing teams, who began to perform other duties in the PHC. Managers and health professionals organized themselves to develop biosafety protocols, provide guidance on the flow of care, and provide training for health professionals.

Data analysis revealed different experiences according to the management and financing capacity of the four municipalities. Biosafety materials were purchased for professionals working on the front lines of COVID-19 to a lesser extent for small municipalities. In addition, there was a mismatch

of information in the contents of the municipal documents, which proved to be disaggregated in relation to the official technical notes at federal and state levels.

The promotion of interdisciplinarity and the integration of teaching and healthcare service as intervening conditions

Interdisciplinarity was identified through the insertion of students and interaction/collaboration among the members of oral healthcare teams with other health professionals. The context of the pandemic meant that oral health teams were assigned to assume active roles, through the implementation of collaborative practices and integration among teams and professionals from other areas. Strategies were adopted to reorganize the work process, such as meetings between oral health professionals and managers; training to collaborate in the reception, screening, and monitoring of suspected or confirmed COVID-19 patients, and providing care at screening centers.

The documents showed that teaching-service integration was absent from smaller municipalities. Municipalities that provide internships for undergraduate dental students reported that these activities had been suspended. Strategies were adopted using Health Information and Communication Technologies (HICT) to circumvent the suspension of activities and avoid educational setbacks. Activities were reorganized for remote access to maintain permanent education and professional training.

Action strategies for oral healthcare management: ensuring access, monitoring indicators, and listening to the user

The theoretical model considered oral health management beyond the clinical-care activities performed by dentists in PHC. However, it revealed that the workload and the production indicators based exclusively on quantity of dental procedures do not allow proper management of oral healthcare. Another situation with negative influence is the disproportion between oral health teams and the population in the area covered by oral healthcare clinics, as well as incomplete oral health teams (i.e., no oral health assistant). Considering the care aspect, the pandemic significantly reduced users' access to oral health services. For the protection of users and professionals, at first, elective dental care

was suspended or restricted according to guidelines from responsible entities.

The municipalities followed the guidelines from the Ministry of Health and State Health Secretariat, maintaining only emergency dental care if the potential risk in the region was severe or extreme, according to the potential risk assessment matrix for COVID-19. Urgencies and emergencies were maintained in the HC and emergency rooms. Consultations with the Dental Specialty Centers (DSC) were initially suspended and then resumed partially and gradually, according to the oral health management guidelines of each municipality. Decisions on the return of activities were based upon the possibilities of making necessary adjustments to the work process to ensure biosafety for users and professionals.

Care and procedures offered were restricted due to concern regarding aerosol-generating procedures, and to the reduction in the number of oral health professionals available as some of them were on leave because they belonged to the groups most vulnerable to COVID-19. The aim of the initial suspension of elective care was to prevent the spread of the virus. Measures were provided to adjust and adapt to biosafety standards.

Adequate supplies were purchased to address the pandemic, and there was a redistribution of oral healthcare teams in the HC, adapting processes, work shifts, and workplaces. Exclusive areas were assigned for the flow of users with symptoms of the disease. These measures prevented crowding of users in waiting rooms and reduced contact between COVID-19 symptomatic and asymptomatic patients. Communication channels with the community were opened using HICT. Service teams were organized and trained to provide information and perform pre-clinical care by phone, video calls, and text messages. In this way, guidelines on COVID-19, health in general (including oral health) and psychological guidelines for health professionals were implemented.

Oral health indicators continue to be entered into the information systems for monitoring. The availability of financial resources (state and federal) would not be affected by the reduction/suspension of services, in either primary or secondary care (DSC and Prosthetic Laboratories).

The social isolation imposed by the COVID-19 pandemic hindered personal contact between

managers and users. Health councils began to meet on virtual platforms available to the community. Emergency committees (composed of community representatives, city councils, health departments, public and private institutions, and local businesses, among others) were set up to organize contingency plans and guidelines on appropriate conduct to guarantee the health and safety of users and healthcare professionals.

The consequence of oral healthcare management in primary health care: organization of the work process through the integration of health promotion, education, prevention, assistance, and rehabilitation actions, with a focus on dentistry

The organization of the work process of oral health professionals as a consequence of the management of oral health care was identified. The work process seeks to integrate actions of health promotion, education, prevention, assistance, and rehabilitation. In this regard, the organization of the agenda is important because it is the means by which healthcare professionals define how much time they allocate to each activity, with the focus remaining on clinical actions.

Dental care was reorganized in response to the pandemic. There was a change in routines to include careful anamnesis with focus on COVID-19, previously screened urgent and emergency care, application of minimally invasive dentistry techniques, and reinforcement of strict biosafety protocols. The “advanced access” model (i.e., resolving the user’s main complaint at the time of the first consultation) was adopted in the HC, to seek greater resolution and reduce patient flow to a minimum.

Specialized care was suspended and/or reduced, with losses in the referral and counter-referral processes in municipalities where there is no regulation system.

The reduction of clinical work due to restrictions on clinical visits led to dentists becoming involved in actions going beyond clinical activities. For example, they developed and distributed to the public health education pamphlets about oral hygiene habits and their relationship with the spread of the new coronavirus. They also posted information on the topic on social networks and other media.

Some, though not all municipalities sought ways to benefit families who participated in the Health at

School Program by including oral hygiene products in the basic food baskets delivered to them. In addition, community health agents conducted a campaign through video lectures providing guidelines for prenatal care.

DISCUSSION

This study analyzed a series of actions in the fight against the COVID-19 pandemic by promoting oral healthcare in four municipalities of Santa Catarina State, using as a reference the dimensions of the theoretical-empirical model on oral healthcare system management. The framework of the model enabled the study of the contents of the documents guiding oral healthcare manager decision-making for organizing actions and services. All the dimensions of the model identified actions to combat the pandemic, finding that the actions either ratified, amplified, or contradicted the model initially studied for theoretical development, compromising, in the latter case, oral healthcare management.

The literature has called attention to the fact that the crisis caused by the pandemic^{28,29} brings with it an opportunity to rethink public management practices and the work of oral health professionals. Efforts must be made to be more responsive to the needs of the population, prioritize groups with a greater burden (or risk of development) of oral diseases, recover the preventive approach, and discuss such obstacles in the oral healthcare system^{2,6,30,31}.

Limiting the offer of public healthcare services to emergency care is particularly damaging to the most vulnerable populations, who are also at greater risk of contracting COVID-19, thus exacerbating inequity³². The literature regards this situation as an opportunity to redirect dental practices to the preventive approach⁶, rethink the future of dentistry, and to discuss the failures of the healthcare system³¹. The relevance of studies such as the current one is that they show the possibility of coordination between theoretical references and the implementation of public policies, as well as the way in which their actions result in benefits for the population.

Several studies have reported reduced access to dental care upon restricting the supply of care only to urgent cases³³⁻³⁶. The crisis caused by the abrupt need to suspend oral healthcare of elective nature^{6,9,37} accentuated the overvaluation attributed to individual clinical dental procedures. As an immediate response, priority strategies were adopted

to make dental care feasible, presented in both governmental⁵ and multilateral documents³⁸ and in scientific literature¹⁰. Such measures have proven to be effective in controlling the transmission of the virus and reducing occupational risk for public service professionals involved in dental care¹¹.

In parallel, an amplification of oral healthcare management was identified by incorporating interdisciplinary actions and services. This integration among professionals has been reported as an important strategy in the consolidation of oral healthcare³⁰ given that these professionals are not usually present in actions of this nature. In particular, dentists can and should contribute to the workforce in a global health crisis³¹, considering that they are trained in dealing with stressful situations, generally possess communicative skills, are familiar with infection control procedures, routinely use protective equipment, are immunized against the main infectious diseases, and tend to be familiar with protocols of medical emergencies¹².

Although studies show that there is persistent difficulty in coordinating and integrating oral healthcare management in the different sectors and levels of the healthcare system^{14,30}, in order to define strategies to address COVID-19 it was necessary to promote such discussions, including oral healthcare issues, with managers. This aspect was identified as enhancing oral healthcare management from a proactive position of the oral health manager in solving the problems arising from the pandemic. However, it is noteworthy that in Brazil, during the first months of the pandemic, oral health and the particularities of dental care were not included in government publications. This made it difficult to obtain targeted, standardized, science-based guidelines, and to make them widely known among managers and professionals. In a way, this was overcome when the Ministry of Health published the "Guide for dental care in the context of COVID-19"¹⁴.

The guarantee of comprehensive healthcare depends on the degree of implementation and functionality of healthcare systems themselves¹⁵. Even before the pandemic, this was already a challenge for oral health care¹⁴ due to an insufficient workforce and the requirement of managers for minimal clinical production in a scenario of high patient demand. In this regard, other studies also show that the high demand from patients interferes with the continuity

of care, as well as its effectiveness, quality of care, and the coordination among different levels of healthcare^{15,27}. With the pandemic, the situation was aggravated by the limitation or impossibility of conducting collective actions, typically by educational and preventive health promoters, and of maintaining full dental services in PHC and specialized services.

The adoption of “advanced access” was mentioned as a model to reorganize the provision of oral health care. Although there is almost no scientific production on the subject in the field of dentistry, this strategy seeks to balance demand and service capacity, with greater control over users’ waiting time. The literature points it out as a promising scheduling model for primary care because it provides the possibility of offering consultations in sufficient quantity for that day, not restricting future consultations, and ensuring continuity of care²². The feasibility and effects of its adoption in a pandemic period still need more research.

Care management involves interventions in the field of health promotion, disease prevention, treatment, and rehabilitation¹⁴. When considering care as a technology for organizing dental work processes, it is necessary to search for ways to achieve comprehensiveness in a broad perspective, and therefore to reflect on the care technologies that are established in public policy actions for oral health¹⁵. Outstanding among these identified care technologies is the use of teledentistry, especially as an alternative tool for contacting patients via telemonitoring and tele-guidance. The literature has positively reported the use of strategic teledentistry in public oral health services. Particularly, in the new pandemic scenario, it has gained strength as one of the central strategies for the reorganization of oral health care practices remotely³⁰⁻³².

This study had some limitations. Initially, the intentional selection of participating municipalities restricts the ability to generalize the results. Despite recognizing the different coping capacities of each municipality, due to the availability of institutional and financial resources, it was not an objective to compare local government actions. Furthermore, the realities presented do not necessarily represent other municipalities in the same South Brazilian state. It was the first opportunity in which the theoretical-empirical model on oral health care management was used to analyze oral health actions and services,

not having undergone a previous validation process. The collection of data by means of documents refers only to the events recorded by those municipalities, without allowing value judgment or inference of difficulties or facilities experienced by management, professionals, or users.

Thus, it is suggested that studies should be conducted to gain more in-depth theoretical constructs on oral healthcare management, thereby improving models of this kind. The relevance of continuing to study the implications of decision-making by local management in relation to public oral health actions and services in coping with the pandemic is emphasized. Particularly noteworthy are responses regarding access and comprehensive care, the care of the most vulnerable populations, the psycho-emotional burden of professionals, biosafety practices, and the incorporation of less invasive and more effective dental technologies and clinical procedures. Additionally, the worsening of epidemiological indicators must be put into context, highlighting the importance of ongoing maximum alert status of oral health services and academia.

It is hoped that this study contributes to improvements within the scope of oral healthcare management at local level. Only with the evolution of scientific and technological knowledge and its application in natural settings will it be possible to implement safer and more viable ways of providing oral healthcare to the population in the context of the COVID-19 pandemic.

CONCLUSION

This study identified actions to tackle the COVID-19 pandemic in all dimensions of the oral healthcare management model while following BPHC principles, the role of oral health management, access, comprehensiveness, interdisciplinarity, teaching-service integration, popular participation, monitoring of indicators and actions specific to oral healthcare clinics. These actions ratified, amplified, or compromised the management of oral health care. In the four municipalities studied, there was a reduction in the supply of services due to the restriction in access to elective dental care and preventive actions; search for guarantee of biosafety assistance standards; dissemination of standardized and science-based guidelines for professionals and the population; attempt to maintain the comprehensiveness of care through the readaptation

of specialized services and collective actions; and relocation of oral health professionals to assist in other sectors and activities. Oral healthcare management can serve as a reference to redesign

oral health actions and services at the local level during the COVID-19 pandemic, in an expanded perspective.

DECLARATION OF CONFLICTING INTERESTS

The authors declare no potential conflicts of interest regarding the research, authorship, and/or publication of this article.

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REFERENCES

- Meng L, Hua F, Bian Z. Coronavirus Disease 2019 (COVID-19): Emerging and Future Challenges for Dental and Oral Medicine. *J Dent Res.* 2020 May;99(5):481-487. <https://doi.org/10.1177%2F0022034520914246>
- Mattos FF, Pordeus IA. COVID-19: a new turning point for dental practice. *Braz Oral Res.* 2020;34:e085. <https://doi.org/10.1590/1807-3107bor-2020.vol34.0085>
- Proffitt E. What will be the new normal for the dental industry? *Br Dent J.* 2020 May;228(9):678-680. <https://doi.org/10.1038/s41415-020-1583-x>
- Peng X, Xu X, Li Y, Cheng L et al. Transmission routes of 2019-nCoV and controls in dental practice. *Int J Oral Sci.* 2020 Mar 3;12(1):9. <https://doi.org/10.1038/s41368-020-0075-9>
- Transmission of SARS-CoV-2: implications for infection prevention precautions. <https://www.who.int/news-room/commentaries/detail/transmission-of-sars-cov-2-implications-for-infection-prevention-precautions>
- Pereira LJ, Pereira CV, Murata RM, Pardi V, et al. Biological and social aspects of Coronavirus Disease 2019 (COVID-19) related to oral health. *Braz Oral Res.* 2020 May 8;34:e041. <https://doi.org/10.1590/1807-3107bor-2020.vol34.0041>
- Stokes EK, Zambrano LD, Anderson KN, et al. Coronavirus Disease 2019 Case Surveillance — United States, January 22–May 30, 2020. *MMWR Morb Mortal Wkly Rep.* 2020;69:759–765. <https://doi.org/10.15585/mmwr.mm6924e2>
- Iyer P, Aziz K, Ojcius DM. Impact of COVID-19 on dental education in the United States. *J Dent Educ.* 2020 Jun;84(6):718-722. <https://doi.org/10.1002/jdd.12163>
- Technical Note GVIMS/GGTES/ANVISA Nº 04/2020. Orientações para serviços de saúde: medidas de prevenção e controle que devem ser adotadas durante a assistência aos casos sSuspeitos ou confirmados de infecção pelo novo coronavírus (SARS-CoV-2) - atualizada 25/02/2021. https://www.gov.br/anvisa/pt-br/centraisdeconteudo/publicacoes/servicosdesaude/notas-tecnicas/nota-tecnica-gvims_ggtes_anvisa-04_2020-25-02-para-o-site.pdf
- Banakar M, Bagheri Lankarani K, Jafarpour D, Moayedi S et al. COVID-19 transmission risk and protective protocols in dentistry: a systematic review. *BMC Oral Health.* 2020 Oct 8;20(1):275. <https://doi.org/10.1186/s12903-020-01270-9>
- Falahchahi M, Babae Hemmati Y, Hasanzade M. Dental care management during the COVID-19 outbreak. *Spec Care Dentist.* 2020 Nov;40(6):539-548. <https://doi.org/10.1111/scd.12523>
- Fisher J, Selikowitz HS, Mathur M, Varenne B. Strengthening oral health for universal health coverage. *Lancet.* 2018 Sep 15;392(10151):899-901. [https://doi.org/10.1016/S0140-6736\(18\)31707-0](https://doi.org/10.1016/S0140-6736(18)31707-0)
- Prasad M, Manjunath C, Murthy AK, Sampath A et al. Integration of oral health into primary health care: A systematic review. *J Family Med Prim Care.* 2019 Jun;8(6):1838-1845. https://doi.org/10.4103/jfmpc.jfmpc_286_19
- Godoi H, Mello AL, Caetano JC. Rede de atenção à saúde bucal: organização em municípios de grande porte de Santa Catarina, Brasil [An oral health care network organized by large municipalities in Santa Catarina State, Brazil]. *Cad Saude Publica.* 2014 Feb;30(2):318-32. <https://doi.org/10.1590/0102-311X00084513>
- Scherer CI, Scherer MD. Advances and challenges in oral health after a decade of the “Smiling Brazil” Program. *Rev Saude Publica.* 2015;49:98. <https://doi.org/10.1590/S0034-8910.2015049005961>
- Pucca GA Jr, Gabriel M, de Araujo ME, de Almeida FC. Ten Years of a National Oral Health Policy in Brazil: Innovation, Boldness, and Numerous Challenges. *J Dent Res.* 2015 Oct;94(10):1333-7. <https://doi.org/10.1177/0022034515599979>
- Marcenes W. The impact of the COVID-19 pandemic on dentistry. *Community Dent Health.* 2020 Nov 30;37(4):239-241. https://doi.org/10.1922/cdh_dec20editorialmarcenes03
- Cecilio LCO. Theoretical-conceptual notes on evaluation processes considering the multiple dimensions of health care management. *Interface (Botucatu);*15(37):589-99. <https://doi.org/10.1590/S1414-32832011000200021>
- Pires FS, Botazzo C. Technological organization of work in oral health in the SUS: an archeology of the national oral health policy. *Health Soc.* 2015;24(1):273-84.
- de Mello AL, de Andrade SR, Moysés SJ, Erdmann AL. Saúde bucal na rede de atenção e processo de regionalização [Oral health care in the health network and the regionalization process]. *Cien Saude Colet.* 2014 Jan;19(1):205-14. <https://doi.org/10.1590/1413-81232014191.1748>
- Soares FF, Figueiredo CRV de, Borges NCM, Jordão RA, et al. The role of the oral health team in the family health strategy: analysis of studies published in the period 2001-2008. *Ciênc. saúde coletiva.* 2011;16(7):3169–80. <https://doi.org/10.1590/S1413-81232011000800017>
- Santos JLGD, Cunha KS, Adamy EK, Backes MTS et al. Data analysis: comparison between the different

- methodological perspectives of the Grounded Theory. *Rev Esc Enferm USP*. 2018;52:e03303. <https://doi.org/10.1590/s1980-220x2017021803303>
23. Mitchell P, Pirkis J, Hall J, Haas M. Partnerships for knowledge exchange in health services research, policy and practice. *J Health Serv Res Policy*. 2009 Apr;14(2):104-11. <https://doi.org/10.1258/jhsrp.2008.008091>
 24. Hoekstra F, Mrklas KJ, Khan M, McKay RC et al. A review of reviews on principles, strategies, outcomes and impacts of research partnerships approaches: a first step in synthesising the research partnership literature. *Health Res Policy Syst*. 2020 May 25;18(1):51. <https://doi.org/10.1186/s12961-020-0544-9>
 25. Nyström ME, Karlton J, Keller C, Andersson Gäre B. Collaborative and partnership research for improvement of health and social services: researcher's experiences from 20 projects. *Health Res Policy Syst*. 2018 May 30;16(1):46. <https://doi.org/10.1186/s12961-018-0322-0>
 26. Corbin J, Strauss A. *Basics of Qualitative Research (3rd ed.): Techniques and Procedures for Developing Grounded Theory*. Thousand Oaks, CA: SAGE Publications, Inc. 2008. <https://dx.doi.org/10.4135/9781452230153>
 27. Freitas CAM, Santos AM dos, Prado NM de BL, Gibbs G. Qualitative data analysis. *Health debate*. 2020;44(125):580–2. <https://doi.org/10.1590/0103-1104202012523>
 28. Cothron A, McLeod C. Time is on the side of change in dentistry. *J Public Health Dent*. 2020 Sep;80 Suppl 2:S100-S103. <https://doi.org/10.1111/jphd.12418>
 29. Leme PAT, Vedovello SAS, Bastos RA, Turato ER et al. How Brazilian dentists work within a new community care context? A qualitative study. *PLoS One*. 2019 May 8;14(5):e0216640. <https://doi.org/10.1371/journal.pone.0216640>
 30. Watt RG. COVID-19 is an opportunity for reform in dentistry. *Lancet*. 2020 Aug 15;396(10249):462. [https://doi.org/10.1016/S0140-6736\(20\)31529-4](https://doi.org/10.1016/S0140-6736(20)31529-4)
 31. Carletto AF, Santos FF dos. The role of the family dentist in the Covid-19 pandemic: the Rio de Janeiro scenario. *Physis*. 2020;30(3):e300310. <https://doi.org/10.1590/S0103-73312020300310>
 32. Brian Z, Weintraub JA. Oral Health and COVID-19: Increasing the Need for Prevention and Access. *Prev Chronic Dis*. 2020 Aug 13;17:E82. Erratum in: *Prev Chronic Dis*. 2020 Aug 27;17:E93. <https://doi.org/10.5888/pcd17.200266>
 33. Yang Y, Zhou Y, Liu X, Tan J. Health services provision of 48 public tertiary dental hospitals during the COVID-19 epidemic in China. *Clin Oral Investig*. 2020 May;24(5):1861-1864. <https://doi.org/10.1007/s00784-020-03267-8>
 34. Consolo U, Bellini P, Bencivenni D, Iani C, et al. Epidemiological Aspects and Psychological Reactions to COVID-19 of Dental Practitioners in the Northern Italy Districts of Modena and Reggio Emilia. *Int J Environ Res Public Health*. 2020 May 15;17(10):3459. <https://doi.org/10.3390/ijerph17103459>
 35. Tysiąc-Miśta M, Dziedzic A. The attitudes and professional approaches of dental practitioners during the covid-19 outbreak in poland: a cross-sectional survey. *Int J Environ Res Public Health* 2020; 17(13):4703. <https://doi.org/10.3390/ijerph17134703>
 36. Noh K, Loke J, Kim K. Could we have prevented all this? A comparison of the British and South Korean primary dental care response to COVID-19. *Br Dent J*. 2020 Jun;228(12):916-918. <https://doi.org/10.1038/s41415-020-1705-5>
 37. Cirillo N. COVID-19 outbreak: succinct advice for dentists and oral healthcare professionals. *Clin Oral Investig*. 2020 Jul;24(7):2529-2535. <https://doi.org/10.1007/s00784-020-03323-3>
 38. World Health Organization. (2020). Considerations for the provision of essential oral health services in the context of COVID-19: interim guidance, 3 August 2020. World Health Organization. <https://apps.who.int/iris/handle/10665/333625>.