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IMPACTO DA PANDEMIA DE COVID-19 NO NÚMERO DE TRATAMENTOS CONCLUÍDOS E DE ENCAMINHAMENTOS NAS CONSULTAS ODONTOLÓGICAS DE URGÊNCIA NAS UNIDADES DE ATENÇÃO BÁSICA DE SAÚDE DO BRASIL: UM ESTUDO LONGITUDINAL

Orientador: Profa. Dra. Patrícia Maria Poli Kopper Móra

Porto Alegre
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Orientador: Profª. Drª. Patrícia Maria Poli Kopper Móra

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“O limite é um fronteira criada só pela mente”
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RESUMO

No ano de 2019, após se instaurar a pandemia causada pelo vírus SARS-COV-2, houve uma mudança brusca afetando a vida da população em várias esferas, como na busca por atendimentos odontológicos. Por isso, o objetivo desse estudo foi avaliar o impacto da pandemia COVID-19 no número de procedimentos concluídos e encaminhamentos realizados em consultas de urgência odontológica em unidades básicas de saúde no Brasil, bem como sua associação com fatores socioeconômicos, geodemográficos e índices pandêmicos dos municípios. Foram realizadas comparações entre o período de 12 meses que antecederam e 12 meses durante a pandemia em municípios brasileiros que forneceram algum tipo de atendimento odontológico de urgência no período inicial (n = 5229 municípios de 5570). As variáveis de desfecho foram as diferenças entre o número de tratamentos concluídos e de encaminhamentos para outras especialidades realizados em consultas de urgência odontológica em unidades básicas de saúde no Brasil. Os dados foram extraídos de bases oficiais. Ainda foi realizada uma análise descritiva e análise por regressão logística múltipla com os fatores preditivos. As taxas de urgências odontológicas aumentaram de 3987,9 para 4272,4 a cada 100 mil habitantes. Além disso, 44,1% e 53,9% dos municípios diminuíram o número de encaminhamentos e de tratamentos odontológicos concluídos nas consultas de urgência, respectivamente. Maior número de equipes de saúde bucal na estratégia saúde da família (OR = 1,52,95% IC: 1,21-1,91) e a presença de centros de especialidades odontológicas reduziram os encaminhamentos (OR = 1,80,95% IC: 1,50-2,16) durante a pandemia. A região Nordeste apresentou a maior redução de tratamentos concluídos. O IDH e o produto interno bruto per capita mais elevados favoreceram o aumento de tratamentos concluídos. Além disso, municípios menos desenvolvidos e menores apresentaram maior probabilidade de não completar o tratamento nas consultas de urgência na atenção básica odontológica na vigência de situações de calamidade. Nesse momento, são necessárias medidas para que a demanda seja atendida da melhor forma possível e que estejamos preparados para calamidades futuras que possam vir a ocorrer.

Palavras-chave: COVID-19, Sistema Único de Saúde, Encaminhamento e Consulta, Odontologia, Centros de Saúde.

ABSTRACT

In 2019, after the outbreak of a pandemic caused by the SARS-COV-2 virus, there was a sudden change affecting the lives of the population in various spheres. Therefore, the aim of this study was to assess the impact of the COVID-19 pandemic on the number of completed procedures and referrals made in emergency dental appointments in basic health units in Brazil, as well as its association with socioeconomic, geodemographic and pandemic indices of counties. Comparisons were made between the 12-month period preceding and the 12-month period during the pandemic in Brazilian municipalities that provided some type of emergency dental care in the initial period (n = 5229 municipalities out of 5570). The outcome variables were the differences between the number of treatments completed and referrals to other specialties performed in emergency dental consultations in basic health units in Brazil.Data were extracted from official databases. A descriptive analysis and multiple logistic regression analysis with predictive factors were also performed. Dental emergency rates increased from 3987.9 to 4272.4 per 100 thousand inhabitants. In addition, 44.1% and 53.9% of the municipalities reduced the number of referrals and dental treatments completed in emergency consultations, respectively. A greater number of oral health teams in the family health strategy (OR = 1.52.95% CI: 1.21-1.91) and the presence of dental specialty centers reduced referrals (OR = 1.80.95 %CI: 1.50-2.16) during the pandemic. The Northeast region showed the greatest reduction in completed treatments. Higher HDI and per capita gross domestic product favored an increase in completed treatments. In addition, less developed and smaller municipalities were more likely to not complete treatment in emergency dental care consultations in the event of calamity. At this moment, measures are needed so that the demand is met in the best possible way and that we are prepared for future calamities that may.

Keywords: COVID-19, Unified Health System, Referral and Consultation, Dentistry, Health Centers.

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1 APRESENTAÇÃO

A presente dissertação teve como foco de estudo avaliar as possíveis alterações do número de tratamentos concluídos e de encaminhamentos para os Centros de Especialidades Odontológicas (CEOs) realizados nas consultas de urgência da atenção básica de saúde no Brasil, comparando-se o período de um ano antes com um ano durante a pandemia de COVID-19. Os fatores associados a ambos os desfechos (tratamentos completados e encaminhamentos) também foram investigados. Os dados avaliados foram obtidos em sites de acesso público disponibilizados pelo governo brasileiro.

Esta dissertação de mestrado está estruturada da seguinte maneira:

- Introdução, enfatizando os pontos principais deste estudo;
- Artigo: "*Impact of the COVID-19 pandemic on the number of completed treatments and referrals during dental urgency consultations at the Brazilian public health care system"* a ser submetido para o periódico Clinical Oral Investigations;
- Considerações finais.

2 INTRODUÇÃO

A pandemia causada pelo vírus SARS-COV-2 se instalou mundialmente no ano de 2019 tornando-se um marco histórico relacionado a mudanças na saúde física e mental da população bem como impactando diretamente na vida socioeconômica.

Desde então, a rotina da população mudou bruscamente e, mesmo assim, após mais de um ano e meio ainda há um número considerável de diagnósticos da doença e de mortes causadas por ela. Segundo o Boletim epidemiológico lançado pelo Ministério da Saúde, até o dia 23 de outubro de 2021 foram confirmados 243.354.428 casos de COVID-19 no mundo. O Brasil encontra-se na terceira posição com maior número de casos acumulados (21.723.559) e ocupa o segundo lugar com o maior número de mortos até o momento (605.457), sendo que mundialmente já se somam 4.943.926 óbitos (BRASIL, 2021a).

Instituições a nível do governo federal, estadual e municipal seguem incentivando as medidas de prevenção que foram descritas pela Organização Mundial de Saúde (BRASIL, 2021b). Tem sido veiculada, através de todos os meios de comunicação, a importância do uso do álcool gel 70%; a necessidade de lavagem das mãos com água e sabão a maior quantidade de vezes possível e da utilização de máscaras; a importância de evitar tocar as mãos nos olhos, nariz e boca; e a recomendação de respeito ao isolamento social e permanência em locais com fluxo de ar (AQUINO *et al*.,2020; ORGANIZAÇÃO PAN-AMERICANA DE SAÚDE, ORGANIZAÇÃO MUNDIAL DE SAÚDE, 2020).

Essas mudanças repentinas afetaram as pessoas em várias esferas, incluindo a psicológica, levando ao desenvolvimento de um maior número de indivíduos com ansiedade, estresse e depressão (MRKLAS *et al.*, 2020). Um estudo realizado por Brooks e colaboradores em 2020 descreveu que as consequências geradas terão efeitos duradouros tanto para a população quanto para o Sistema de Saúde, sendo ambos afetados pelos efeitos pós-traumáticos, além dos problemas financeiros.

Da mesma forma, o acesso da população a atendimentos odontológicos foi afetado, seja pelo fechamento dos serviços em função do possível contágio do paciente e/ou do profissional durante as consultas, seja por receio dos pacientes em procurarem atendimento em função do medo de contrair a

infecção. Entre as formas de contágio, a disseminação de aerossóis é a mais comum, colocando os cirurgiões-dentistas em alto risco de aquisição e de transmissão da doença quando medidas corretas de biossegurança não são adotadas (BIZZOCA; CAMPISI; MUZIO, 2020). Estudos mais atuais demonstram que os atendimentos odontológicos quando são ofertados com medidas de controle de infecção, como bochechos pré-operatórios e o uso de sugador intraoral de alto volume, se tornam mais seguros e passíveis de serem realizados, não sendo potencial para aumento da transmissão do vírus (MEETHIL *et al*., 2021).

Uma alternativa para redução da circulação de pessoas no consultório odontológico nesse período pandêmico foi a implantação das teleconsultas, auxiliando no diagnóstico, na orientação e no acompanhamento de casos, favorecendo tanto o paciente quanto o profissional de saúde (GHAI, 2020; TALLA et al., 2020). Um estudo realizado no Rio Grande do Sul, antes da pandemia da COVID-19, demonstrou que a oferta do atendimento odontológico por meio de consultas por telefone e/ou videio chamada fez com que houvesse uma redução nos encaminhamentos das unidades de atendimento básico para os centros de especialidades odontológicas em mais de 45% (BAVARESCO *et al*., 2020).

De acordo com os achados de Ahmed *et al.* (2020), 78% dos cirurgiões-dentistas, que responderam um questionário a respeito do medo de realizar atendimentos durante a pandemia e sobre as modificações realizadas nos protocolos de biossegurança, mostraram-se apreensivos e ansiosos. Destes, 90% declararam ter consciência da necessidade de modificação dos protocolos de atendimento; entretanto, apenas 61% confirmaram ter realizado tais modificações. Chama atenção o elevado percentual de cirurgiões-dentistas que, apesar da ciência em relação a necessidade de modificações, não realizaram medidas de maior proteção a infecção cruzada. Tal fato talvez possa ser explicado pelo aumento dos custos e do desconforto do profissional ao realizar essas adequações (ROSSATO *el al.,* 2021).

Outra pesquisa realizada com 2.195 cirurgiões-dentistas atuantes nos Estados Unidos, no período de 8 a 12 de junho de 2020, demonstrou que 20 (0.9%) destes contraíram a infecção e que 99.7% tomaram medidas de segurança como desinfecção, rastreamento de COVID-19, distanciamento social

e uso de máscaras faciais. Porém, equipamentos de proteção individual recomendados pelo Centro de Controle e Prevenção de doenças, apenas 72.8% faziam uso. E, mesmo assim as taxas de prevalência e o número de positivados foi baixa. Logo, pode-se inferir que as medidas usadas para o controle da infecção são suficientes para a prevenção da doença no ambiente de atendimento odontológico (ESTRICH et al., 2020). Acredita-se que um dos fatores que leva a diminuição da contaminação da classe odontológica é o fato de que antes do surgimento da COVID-19 já se utilizava medidas de desinfecção e uso de equipamentos de proteção individual para a prevenção de outras doenças por estes profissionais.

No que diz respeito a abertura dos serviços odontológicos no período da pandemia, de acordo com a American Dental Association (ADA) compete às organizações estaduais de cada localidade definir o risco de contaminação de sua região e, assim, determinar o fechamento/abertura dos consultórios odontológicos. Entretanto, deixa claro que, independentemente do risco, os atendimentos de emergência e urgência necessitam ser ofertados a qualquer tempo com os devidos cuidados (AMERICAN DENTAL ASSOCIATION, 2021).

Segundo o Ministério da Saúde, de acordo com seu boletim mais recente (SEMANA EPIDEMIOLÓGICA 42- 17/10 a 23/10/2021), os números de novos casos e de óbitos se comportam de forma bastante heterogênea nas diferentes regiões do Brasil. A região Sudeste, nesse período, foi a que apresentou tanto o maior número de novos casos como o de óbitos. Porém, se considerarmos desde o lançamento do primeiro Boletim Epidemiológico, as regiões Centro-Oeste e Sul registraram o maior coeficiente de incidência acumulada de casos, enquanto o Nordeste apresentou o menor. Em relação ao número de mortes acumuladas, lidera a região Centro-Oeste, seguida pela região Sudeste e Sul, sendo o menor índice encontrado na região do Nordeste (MINISTÉRIO DA SAÚDE, BE 86 - BOLETIM COE CORONAVÍRUS, 2021).

No que se refere aos atendimentos odontológicos nesse período, durante as fases de alto risco de transmissibilidade da doença, algumas regiões do Brasil mantiveram em funcionamento apenas os serviços odontológicos de urgência na atenção primária da rede do Sistema Único de Saúde (SUS). Frente a essa situação, o perfil dos atendimentos de urgência durante a pandemia, bem como dos encaminhamentos, realizados após a conclusão da consulta, pode ter sido

modificado. O fechamento dos serviços de atendimento odontológico da atenção básica, dos centros de especialidades odontológicas (CEOs), bem como dos consultórios odontológicos privados pode ter impactado nas questões acima referidas de forma diferente, podendo haver influência do perfil geodemográfico e socioeconômico do município.

Além das clínicas e consultórios particulares presentes no Brasil, o país conta com mais de 29 mil cirurgiões-dentistas que atuam na atenção primária da rede do Sistema Único de Saúde (SUS) (PUCCA JUNIOR et al., 2015). Durante as fases mais restritivas da pandemia apenas os atendimentos de emergência e urgência foram mantidos na atenção primária. Frente a essa situação, os profissionais podem ter realizado atendimentos mais resolutivos do que no período pré-pandemia, encaminhando apenas situações muito específicas para os Centros de Especialidades Odontológicas (CEOs).

Os CEOs são estabelecimentos de saúde, participantes do Cadastro Nacional de Estabelecimentos de Saúde - CNES, classificadas como Clínica Especializada ou Ambulatório de Especialidade. As especialidades ofertadas são: Diagnóstico bucal, com ênfase no diagnóstico e detecção do câncer de boca, periodontia especializada, cirurgia oral menor dos tecidos moles e duros, endodontia e atendimento a portadores de necessidades especiais (BRSIL, 2017).

Em 2019 foi publicado um estudo realizado em 27 capitais brasileiras onde avaliaram a estrutura das Unidades Básicas de Saúde para resolução da doença cárie. Foram descritas que apenas 21,6% das capitais estavam totalmente equipadas com materiais e instrumentais, sendo que quanto menor o índice socioeconômico, piores eram as condições para a prevenção e tratamento da saúde bucal. Os autores concluíram que não há uma equivalência entre as condições socioeconômicas/bucais de cada região e a distribuição de recursos (DE SOUSA QUEIROZ et al., 2019). A Amazônia, localizada na região Norte, por exemplo, conta com acampamentos indígenas que ainda tem assistência odontológica debilitada, sendo mais vulnerável a doenças, inclusive a COVID-19 devido a sua cultura, por exemplo, do compartilhamento de objetos (BOSCHIERO et al., 2021).

No que se refere a prestação de atendimento odontológico antes e durante a pandemia no Brasil, Dos Santos e colaboradores (2021) relataram que

houve uma redução de mais de 66% no número total de atendimentos do SUS no Brasil, comparando janeiro a julho de 2019 com o mesmo período em 2020. Em contrapartida, os estados do Pará e Tocantins tiveram um aumento nos atendimentos em 2020 em relação ao ano anterior (DOS SANTOS et al., 2021).

Em Madrid, na Espanha, foram analisados os atendimentos de urgência em clínicas odontológicas durante o período de 17 de março a 4 de maio de 2020. O diagnóstico mais prevalente nas consultas foi o de periodontite apical aguda e a condição de abscesso odontogênico apresentou a menor frequência (RAMÍREZ et al., 2021).

Em Massachusetts, foi utilizada a clínica da Tufts University School of Dental Medicine durante o pico da pandemia (30 de março a 8 de maio de 2020) para a realização dos atendimentos de urgências odontológicas. Dos 267 pacientes atendidos, 27.7% apresentaram dor devido a inflamação da polpa dentária e 13,9% necessitaram de extração dentária. Quando foi necessário atendimento especializado, os mais realizados foram cirurgia oral, restauração e tratamento endodôntico (LANGELLA *et a*l., 2021).

Um estudo no Brasil, realizado por meio da aplicação de questionário do google forms, com perguntas relacionadas a dados sociodemográficos, a transmissão do COVID-19, aos sintomas e cuidados com a biossegurança, atingiu 16.578 dentistas. Entre os dentistas que participaram da pesquisa, 4.048 trabalham na atenção básica ou na atenção especializada. Desses que fazem parte da equipe do Sistema Único de Saúde, 99.41% relataram que a COVID-19 pode ser transmitida durante os atendimentos odontológicos e 83.55% apontaram que os equipamentos de proteção individual que comumente são utilizados não são suficientes para a proteção da contaminação. Ainda, 80.98% consideraram inadequadas as medidas de biossegurança habituais. Além disso, 28% dos profissionais não realizaram nenhum tipo de procedimento durante o período da pandemia e 71.84% afirmaram atender principalmente consultas de urgência. Dos 71.84%, 239 afirmaram realizar também procedimentos eletivos. Quando foi comparado por regiões, os dentistas do Sul, Centro-Oeste e Sudoeste realizaram tratamento odontológico de urgência com maior frequência em comparação com as regiões Norte e Nordeste. Já quando são apresentados os dados de tratamentos eletivos, os profissionais do Norte, Sul e Sudeste

apresentaram os maiores percentuais, enquanto as regiões Centro-Oeste e Nordeste os mais baixos (VIEIRA-MEYER et al., 2020).

Diante dos relatos encontrados na literatura e da necessidade de pesquisas longitudinais para compreender o perfil dos atendimentos de urgência e seus encaminhamentos antes e durante a pandemia por COVID-19 no Brasil, o objetivo do presente estudo foi avaliar o impacto da pandemia COVID-19 sobre o número de procedimentos concluídos e encaminhamentos realizados em consultas de urgência odontológica em unidades básicas de saúde no Brasil, bem como sua associação com fatores socioeconômicos, geodemográficos e índices pandêmicos dos municípios.

3 ARTIGO CIENTÍFICO

O artigo a seguir intitula-se "*Impact of the COVID-19 pandemic on the number of completed treatments and referrals during dental urgency consultations at the Brazilian public health care system"* formatado segundo as normas específicas da revista Clinical Oral Investigation, fator de impacto 3.573 (Qualis A1, CAPES) a qual será submetido.

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Dear Matthias Hannig, D.D.S., Ph.D., Editor in Chief

We are submitting the paper entitled "**Impact of the COVID-19 pandemic on the number of completed treatments and referrals during dental urgency consultations at the Brazilian public health care system**", written by Luciéli Andréia Zajkowski, Roberta Kochenborger Scarparo, Heloisa Grehs e Silva, Roger Keller Celeste, Patrícia Maria Poli Kopper for your consideration to publication in the *Clinical Oral Investigations*.

In consideration of the editors of the *Clinical Oral Investigations* taking action in reviewing and editing this submission, the author(s) undersigned hereby transfer, assign or otherwise convey all copyright ownership to Sringer in the event that such work is published in that Journal.

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All authors approve release of this material for publication and authorize the editor to publish the material in case it is accepted.

Sincerely,

Luciéli Andréia Zajkowski
Roberta Kochenborger Scarparo
Heloisa Grehs e Silva
Roger Keller Celeste
Patrícia Maria Poli Kopper

Impact of the COVID-19 pandemic on the number of completed treatments and referrals during dental urgency consultations at the Brazilian public health care system

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Abstract

Introduction: This study assessed the impact of the COVID-19 pandemic on the number of completed procedures and referrals made in dental urgency consultations in basic health units in Brazil, as well as its association with socioeconomic, geodemographic and pandemic index factors in the municipalities.

Methods: Difference rates of procedures between twelve months before and during the COVID-19 pandemic were calculated, including only municipalities that provided some care for dental urgency at baseline period (n=5229 municipalities out of 5570). Data were extracted from health information systems at municipal level. Multiple logistic regression predicted factors related to referrals and completed treatments.

Results: Dental urgencies rates increased per 100 thousand inhabitants from 3987.9 to 4272.4. While 44.1% of municipalities decreased their rates of referrals, 53.9% decreased rates in completed dental treatment during urgency consultations. Greater number of oral health teams in the family health strategy (OR=1.52,95%CI:1.21-1.91) and the presence of dental specialties' centers (OR=1.80,95%CI:1.50-2.16) reduced referrals during pandemic. Northeast region showed the greater reduction of completed treatments. Higher HDI and gross domestic product per capita favored the increase of completed treatments.

Conclusions: The calamity situation generated by the long period of pandemic resulted in a greater demand for urgency consultations. Less developed and smaller Brazilian municipalities are more likely to not complete treatments during urgency consultations in primary dental care in the presence of calamity situations.

Clinical relevance: To provide an adequate assistance and to improve service resolvability during emergency situations, actions that equip primary dental care in smaller and less developed municipalities should be considered.

Keywords: COVID-19, Unified Health System, Referral and Consultation, Dentistry, Health Centers.

Introduction

Brazil is one of the few countries in the world where oral health care is part of the universal health care system, and it is offered with no direct cost to the users [1]. The universal health care system is funded by federal, state, and municipal governments, but the delivery of services is made by municipalities in the so called unified health system ("Sistema Único de Saúde" [SUS]). Within this context, health surveillance systems and administrative databases related to the consultations are available at municipal level from official sources [2,3].

The pandemic caused by the SARS-COV-2 virus was installed worldwide in the end of 2019, becoming a historical landmark impacting in the delivery of health services [4-7]. Aerosols is the most common way of transmission, putting dentists at high risk of acquiring and transmitting the disease when appropriate biosafety measures are not adopted [8]. To contain the spread of sars-cov-2, governmental measures of social isolation and lockdown of non-essential services were interspersed with periods of flexibilization for economic activities [9].

At the initial period of the pandemic, the recommendations of the dental societies worldwide were focused in maintain only emergency and urgency dental care and the use of teledentistry services increased [10-13]. In this situation, the urgency profile care may have been modified by the pandemics. For example, conditions that would be otherwise referred to an specialist may have been treated as much as possible and not referred. In addition, the reductions in primary and secondary dental care services may differ according to characteristics of the municipality. Up to date, some investigations reported changes in the profile of urgency consultations during the COVID-19 pandemic, showing an increase of dental pain related to oral infections [14,15]. A study observed that symptomatic irreversible pulpitis comprised the largest proportion of dental emergencies in Wuhan [14]. Another investigation reported an increase in dental and oral infection and a reduced number of dental trauma during COVID-19 pandemic [15]. However, the previous reports evaluated only convenience samples in specific emergency services and there is a lack of population-based representative studies comparing before and during pandemic. In this sense, a recent bibliometric analysis showed a low level of scientific evidence provided by the dental literature on COVID-19 [16].

Evidence on how much the urgency consultations provide complete treatments or referrals can help to predict dental care demand and plan strategies that avoid the collapse of health services and assure people receive appropriate healthcare. This is especially relevant because unmet demand may turn into emergency situations. In Brazil, the access to primary dental care is significantly higher in the most developed municipalities [17]. Therefore, it is possible that socioeconomic and demographic factors, public police, and oral health services coverage have an important role in post calamity periods.

Thus, this study assessed the impact of the COVID-19 pandemic on rates of completed procedures and referrals made in dental urgency consultations in basic health units in Brazil, as well as its association with socioeconomic, geodemographic and pandemic index factors in the municipalities.

Methods

The present study was reported in accordance with the guideline entitled Strengthening the Reporting items specific to observational studies using routinely collected health data (RECORD).

Study design

This is an ecological longitudinal study using all Brazilian municipalities as the units of analysis. Comparisons were made between two periods: (a) before (March 2019 to February 2020) and (b) during (March 2020 to February 2021) the COVID-19 pandemic, including only municipalities that provided some care for dental urgency at baseline period (n=5229 municipalities out of 5570). The rates of referrals to dental centers and of completed treatments performed in dental urgency consultations in the Brazilian basic health units were calculated. The association of geodemographic, socioeconomic and pandemic indexes with both outcomes were analyzed. This study did not require ethical approval as it used only public aggregated data.

Data Source

Data were extracted from free access secondary databases, including the Primary Health Care Information System (SISAB), Ambulatory Information System (SIA-SUS), Hospital Information System (SIH), Brazilian Institute of Geography and Statistics (IBGE) and National Register of Health Facilities (CNES). Those databases are official sources of information made available by Federal agencies through their websites. Data collection was carried out in May 2020. All information was extracted at the city level.

Outcome Variables

The outcome variables are the differences between the rates of urgency dental consultations that have their treatments completed and/or that were referred to other specialties per 100.000 inhabitants-year in Brazilian municipalities, comparing the periods before and during COVID-19. The difference was dichotomized, and municipalities were classified as "reduction" (code=1) or "increase/stable" (code=0).

Main predictors and covariates

All states implemented restrictions for municipalities based on several factors, including COVID-19 hospitalizations. Thus, this indicator was used as an instrumental variable to predict COVID-19 pandemic restrictions. The hospitalizations rates due to COVID-19 per 100.000 inhabitants, were classified in "none", “zero to one hundred (0-100)” and "more than one hundred (>100)". COVID data is available from the official health information system and collated from March 2020 to February 2021.

Socioeconomic development was measured using the Human Development Index (HDI), Gross Domestic Product (GDP) and income distribution (Gini). HDI is calculated at the municipal level based on the 2010 census and was classified in “very low/low (41.8 – 61.9)”, “medium (62.0 – 70.1)” and “high/very high (70.2 – 86.2)”. GDP per capita in 2017 was collated from official (government) sources and dichotomized in “US$ <= 5.177” or “US$ > 5.177”. Gini distribution was collected also based on the 2010

census and was classified in three categories (<=0.45; 0.46-0.54; >=0.55) where zero means equal distribution and 1 completely unequal distribution.

Moreover, broad public policies as previously described, city size, geographical region, coverage of primary dental care and presence of dental specialities centers were incorporated into the analytical model as they were considered potential confounding factors. Broad public policies was dichotomized in the national median values; city size was classified in five categories according to the number of inhabitants (<10, 11-20, 21-50, 51-100 or >100 thousands); the five Brazilian geographical regions were considered (Middle-west, Northeast, North, Southeast, South); coverage of primary dental services were classified in five categories (0-10; 11-20; 21-30; 31-40; >40), according to the number of oral health teams in family health strategy per 100 thousand inhabitants; and, the specialities centers data were dichotomized in "none" or "greater than zero (>0)".

Statistical analysis

Annual mean and standard deviation per 100 thousand inhabitants, before and during COVID-19 pandemic of urgency consultations and its resulting referrals to dental centers and completed treatments in Brazilian municipalities were described in tables. Likewise, annual mean and standard deviation of the difference rate between the two periods were presented. The rate comparisons before and during COVID-19 pandemic were tested using sign test of medians.

Further descriptive analysis showing the percentage of municipalities that decreased rates of referrals to dental centers and of completed treatments compering the 12 months before and during pandemic was presented. Bivariate analyses used Kruskal-Wallis test for rate differences and chi-square test for dichotomous variables. Multiple logistic regression analysis was performed using stepwise method to predict the chances of a municipality to decrease the rate of referral to dental centers and completed treatments.

Results

During the year with COVID-19 pandemic, the number of urgency consultations increased 7.1% per 100 thousand inhabitants compared with the 12 months before (3987.9 - 4272.4). In the same way, the completed treatments rate during urgency consultations increased 11.1% (1856.3 - 2063.7).Differently, the referrals to dental centers reduced 3.5% (525.3 - 506.4) . (Table 1).

Despite the increase at the annual mean of completed treatments during urgency consultations, most of Brazilian municipalities presented reduction (53.9%) (Table 2). It is noteworthy reduction in the rates of completed treatments in North (-347.0±3017.1), Northeast (-806.3±3052.8) and Midwest (-228.2±3284.1) regions. Moreover, municipalities with the lowest HDI (-690.4±3386.6) and income distribution (-463.4±2929.7) showed higher decrease on completed treatments (Table 4). With regards of referrals to dental centers after urgency consultations, despite the decrease of the annual mean, most of the Brazilian municipalities showed increase (55.9%). In this regard, the south region was the only showing increased referrals (91.9±809.5). Besides, referrals presented increased rates in municipalities without specialities' centers (6.5±1390.0) and decreased in that where specialized services are offered (-

133.5±1125.1). Municipalities with less than 10.000 inhabitants were less affected by referral's reduction (-11.6±1724.6) (Tab 3). Bivariate analyses revealed that, except the presence of dental specialties' centers, all variables tested influenced the number of completed treatments. In contrast, only dental specialties' centers, public health scores and geographic region affected referrals to dental centers (Tables 2, 3 and 4).

Multiple stepwise logistic regression analysis shows that city size, , HDI, gross domestic product per capita, coverage of primary dental care and presence of dental specialties' centers are associated with the decrease in referrals to dental centers rates during COVID-19 pandemic. The chance of reducing the number of referrals was directedly related to city size, being this outcome more perceptive in cities with more than 100 thousand inhabitants (OR=1.73, 95%IC:1.25-2.38). North (OR=0.75, 95%IC:0.59-0.96) and South (OR=0.54 95%IC:0.45-0.65) regions are less likely to reduce referrals than the southeast region. Cities with higher HDI (OR=1.33, 95%IC:1.05-1.69) and gross domestic product per capita (OR=1.18, 95%IC:1.00-1.39) presented a slight decrease of referrals to dental centers after urgency consultations compared to cities with these lowest indicators. The number of oral health teams in the family health strategy was directly related to referrals decrease, and cities presenting more than 40 teams showed 1.52 greater odds compared to that with 0-10 teams. Similarly, the presence of dental specialties' centers in the municipalities has favored the reduction of the referrals to dental centers (OR=1.80, 95%IC:1.50-2.16) (Table 5).

Regarding the number of completed treatments during urgency consultations, the stepwise multiple logistic regression showed that city size, geographic region, HDI and gross domestic product per capita were associated with the outcome. Northeast region showed the greater reduction of completed treatments compared to southeast region (OR=3.57, 95%IC:2.95-4.33). It is noteworthy that higher HDI and gross domestic product per capita (OR=0.86, 95%IC:0.73-1.01) favors the increase rather than the reduction of completed treatments after urgency consultations. In this regard, municipalities presenting high or very high HDI showed 0.79 greater odds compared to that with very low or low HDI (Table 5).

Discussion

This study improved the understanding of relevant factors of urgency dental care demand during pandemic. After a year of COVID-19 pandemic in Brazil the number of urgency consultations and the rate of completed treatments significantly increased and the referrals to dental centers reduced compared with the 12 months before. The increase in the urgency consultation resolvability, that occurred at primary care, can be related to the specialty's centers closure during the restriction period [10,12,18, leading primary care centers to solve as much as possible. This fact highlighted the possibly of primary care to solve more complex situations, making the flow of referrals from primary care to specialized centers to be rethought. It is important to point out that, despite the increase at the annual mean of completed treatments during urgencies, most of Brazilian municipalities presented reduction in total consultations. Moreover, the municipalities that increased the completed treatments were not necessarily those that reduced referrals. According to the present findings, city size, geographical region, human development index and gross domestic product per capita were associated with both outcomes. However, number of oral health teams in the family health strategy and presence of dental specialties centers influenced only the referrals to dental

centers. Understanding how these factors may impact the urgency consultation resoluteness is decisive for planning future actions in the post-period of emergencies situations.

Despite the important contribution of this investigation, available health system databases contain notification errors and missing reports, that increased standard-deviation. However, considering that this is likely random errors, the large sample size partially compensates this limitation. As a strength, the longitudinal design adopted herein allowed determining a temporal effect making a greater association of cause and effect possible. Besides, the selection bias was ruled out because database coverage means that all Brazilian municipalities were included.

Differently from previous investigations on COVID-19 pandemic [5-7], the present study made it possible to understand the longer effects of the pandemic on dental care. The observation of a year of pandemic made it possible to include not only periods of greater restriction as periods of socio-economic flexibility. Interestingly, pandemic indicator (Hospitalization rate due to COVID-19) was not associated with the outcomes. These finding differs from Chisini *et al*. 2021 [7] that found a positive association between the COVID-19 pandemic indicator and dental procedures. These differences probably are related to our longer period of analysis, showing that the effect of the pandemic indicators on the resoluteness of urgency consultations was washed out. After the first period of COVID-19 pandemic, the society and oral health professionals could understand the pandemic risks and dynamic [8,19], making the pandemic effects part of people's routine and no longer a limiting factor for their actions.The regression model confirmed that socioeconomic and demographic factors, public police, and oral health services coverage have an important role in the reduction of the referrals after urgency consultations during the pandemic. Brazil municipalities are responsible for the local management of health services and actions [20], the resource invested in health care system differs from place to place. Large and developed cities as well as places with higher coverage of primary and secondary dental care were more likely to reduce the referrals. Those association may be probably related to better equipped centers allowing the dentist to complete the treatment without the need for referral to specialized centers.

The fact that cities with specialized centers favored the reduction of referrals seems contradictory. However, it is possible that municipality with proper referral system have primary health care less equipped to provide complex treatment and were mostly affected by closing specialized centers. Moreover, the absence of public specialties centers in some municipality does not prevent the referral. In those places the primary care dentist could referral to private services. This situation highlighted that after calamity situations, the specialized centers will have a large unmet demand.

Only public police, socioeconomic and demographic factors were associated with the reduction of the number of completed treatments during the pandemic. This outcome is in line with the referrals. Hig 7 IDH and gross domestic product per capita, that influenced the reduction of referrals, favored the increase of completed treatment. This probably occurred due to better service conditions in primary care conditions at these places. Despite the increase at the coverage of primary dental care at municipalities with lower IDH between 2008 and 2015, Santos et al (2021) [21] showed that it was still insufficient, maintaining inequalities. Moreover, the Northeast region are more likely to reduce completed treatments during the pandemic period than the Southeast (OR = 3,57, IC 95%: 2,95-4,33). In this regard, regional and cultural

differences in the Brazilian macro-regions should affect health behaviors, thus impacting the urgency consultations profile at public dental services [22,23].

In conclusion, the calamity situation generated by the long period of pandemic resulted in a greater demand for urgency consultations. Moreover, less developed and smaller municipalities were more likely not to complete treatments during urgency consultations in primary dental care in the presence of calamity situations. In these cases, dentists need to refer patients to elective and specialized care. In the absence of referral system there may be an increase in unmet demand at both primary and secondary care. The present study did not show an impact of the pandemic intensity indicators (hospitalizations) on completed treatments and referrals after urgency consultations at the primary dental care. However, it showed that municipalities with fewer resources were more affected by the lack of elective and specialized services during the pandemic, demonstrating the need for public policies that can meet the repressed needs. In the long term, actions that equip primary care in smaller and less developed municipalities can help improve the resolution of primary care, preparing these places for possible future calamities.

Compliance with ethical standards

Conflict of interest: The authors declare that they have no conflict of interest.

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Ethical approval: For this type of study, formal consent is not required.

Informed Consent: For this type of study, formal consent is not required.

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Tables

Table 1 – Annual mean and standard-deviation (stdDev) per 100 thousand inhabitants-year of dental urgencies consultations, referrals to dental centers and completed treatments before (March 2019 – February 2020) and during (March 2020 – February 2021) COVID-19 pandemic in Brazil.

	Annual Mean	*StdDev*
Dental urgengy consultations		
March 2019 – February 2020	3987.9	±5979.9
March 2020 – February 2021	4272.4	±6393.0
Rate difference	284.5*	±4596.4
Referrals to dental centers		
March 2019 – February 2020	525.3	±1431.0
March 2020 – February 2021	506.4	±1477.0
Rate difference	-18.9*	±1346.8
Completed treatments		
March 2019 – February 2020	1856.3	±3268.1
March 2020 – February 2021	2063.7	±4118.0
Rate difference	207.4*	±4446.5

*Significant difference showed by sign test of medians before and during COVID-19 pandemic ($P<0.05$).

Table 2 – Percentage of annual reduction in referrals to dental centers and in completed treatment during urgency consultations comparing 12 months before and during the COVID-19 pandemic in Brazil at city-level.

		Reductions in referrals to dental centers		*Reductions in completed treatment*	
	n	%	P-value*	%	P-value*
Total	5229	44.1		53.9	
City size (thousands) in 2020					
<10 inhab	2225	37.0	<0.01	51.5	<0.01
11 - 20 inhab	1289	45.5		55.9	
21 - 50 inhab	1058	49.5		60.0	
51 - 100 inhab	338	54.7		55.3	
>100 inhab	319	59.6		40.1	
*Gross domestic product per capita in 2017***					
US$ <= 5.177	2701	44.4	0.70	62.0	<0.01
US$ > 5.177	2528	43.9		45.2	
Coverage of Primary dental care in 2019 (oral health teams in the family health strategy per 100 thousand inhabitants)					
0 - 10	860	42.7	0.56	40.9	<0.01
11 - 20	840	45.0		53.8	
21 - 30	1102	45.4		56.9	
31 - 40	1134	45.0		55.4	
>40	1293	42.8		58.6	
Dental Specialities Centers					
None	4280	40.2	<0.01	53.9	0.93
>0	949	61.8		53.7	
Municipal Human Development Index in 2010					
41.8 – 61.9 (very low/low)	1370	42.0	0.17	68.8	<0.01
62.0 – 70.1 (medium)	2084	45.0		54.9	
70.2– 86.2 (high/very high)	1771	44.9		41.1	
Income distribution in 2010 (0 = equal; 1= completely unequal)					
<= 0.45	1394	40.5		46.4	<0.01

0.46 – 0.54	2706	45.1		54.1	
>= 0.55	1121	46.3		62.3	
Public Policy Score					
Better than National Median	2562	46.3	<0.01	48.1	<0.01
Worse than National Median	2613	42.3		59.7	
Hospitalization rate due to COVID-19 per 100 thousand inhabitants (March 2020- February 2021)					
None	2989	40.4	<0.01	53.7	<0.01
0-100	1082	47.7		59.4	
>100	1158	50.4		49.2	
Geographical Region					
Middle-west	444	45.3	<0.01	57.2	<0.01
Northeast	1770	48.4		71.2	
North	424	38.4		59.9	
Southeast	1583	47.6		35.8	
South	1008	33.1		47.7	

*Kruskal-wallis test
** In July 30 2017 1US$=5.17 RS$

Table 3 – Annual mean consultations and standard-deviation (stdDev) of referrals to dental centers before (March 2019 – February 2020) and during (March 2020 – February 2021) COVID-19 pandemic according to several characteristics at city level (n=5229).

	Total		*Annual rate of referral before pandemic*			*Annual rate referral during pandemic*			*Rate diference*		
	n	%	Mean	StdDev	P-values*	Mean	StdDev	P-values*	Mean	StdDev	P-values*
City size (thousands) in 2020											
<10 inhab	2225	42.6%	538.4	1866.8	<0.01	526.9	1871.3	<0.01	-11.6	1724.6	0.02
11 - 20 inhab	1289	24.7%	508.8	1073.3		463.2	1012.6		-45.6	1009.4	
21 - 50 inhab	1058	20.2%	545.6	1023.1		569.3	1336.0		23.7	1100.9	
51 - 100 inhab	338	6.5%	572.1	892.5		500.5	945.0		-71.6	764.0	
>100 inhab	319	6.1%	384.0	525.6		336.1	537.0		-47.9	483.5	
*Gross domestic product per capita in 2017***											
US$ <= 5.177	2701	51.7%	470.5	1377.8	0.19	464.4	1324.3	0.96	-6.1	1432.3	0.19
US$ > 5.177	2528	48.3%	583.9	1483.8		551.3	1623.3		-32.6	1249.2	
Coverage of Primary dental care in 2019 (oral health teams in the family health strategy per 100 thousand inhabitants)											
0 - 10	860	16.4%	347.0	1122.5	<0.01	339.2	965.1	<0.01	-7.8	947.3	0.15
11 - 20	840	16.1%	410.7	887.1		367.7	798.0		-43.0	819.8	
21 - 30	1102	21.1%	539.3	1370.2		532.9	1644.4		-6.4	1554.4	
31 - 40	1134	21.7%	607.0	1341.9		550.6	1363.7		-56.4	1143.8	
>40	1293	24.7%	634.9	1926.2		646.4	1950.9		11.6	1760.0	
Dental Specialities Centers											
None	4280	81.9%	462.1	1478.0	<0.01	468.6	1512.9	<0.01	6.5	1390.0	<0.01
>0	949	18.1%	810.5	1154.4		676.9	1289.4		-133.5	1125.1	
Municipal Human Development Index in 2010											
41.8 – 61.9 (very low/low)	1370	26.2%	342.4	914.0	<0.01	367.5	1070.8	<0.01	25.1	1003.0	0.03
62.0 – 70.1 (medium)	2084	39.9%	557.8	1541.8		518.8	1388.3		-39.0	1549.4	
70.2– 86.2 (high/very high)	1771	33.9%	629.2	1601.9		599.2	1806.3		-30.0	1323.5	
Income distribution in 2010 (0 = equal; 1= completely unequal)											

<= 0.45	1394	26.7%	669.5	2019.3	<0.01	645.6	1999.1	<0.01	-23.8	1967.5	0.89
0.46 – 0.54	2706	51.7%	507.9	1175.1		498.2	1333.1		-9.7	1074.1	
>= 0.55	1121	21.4%	385.3	1044.7		352.9	931.3		-32.4	921.7	
Public Policy Score											
Better than National Median	2562	49.0%	707.3	1789.1	<0.01	653.9	1841.9	<0.01	-53.4	1673.8	<0.01
Worse than National Median	2613	50.0%	349.3	936.9		362.0	985.4		12.7	930.7	
Hospitalization rate due to COVID-19 per 100 thousand inhabitants (March 2020- February 2021)											
None	2989	57.2%	527.9	1639.8	<0.01	523.0	1673.5	<0.01	-4.9	1506.9	0.14
0-100	1082	20.7%	481.7	1156.7		424.7	997.3		-57.0	1045.6	
>100	1158	22.1%	559.5	1027.1		539.9	1298.9		-19.5	1144.0	
Geographical Region											
Middle-west	444	8.5%	484.8	990.7	<0.01	424.2	1047.9	<0.01	-60.6	1000.1	<0.01
Northeast	1770	33.8%	439.8	1062.9		412.1	1027.9		-27.7	982.9	
North	424	8.1%	242.0	769.2		207.6	667.5		-34.4	687.4	
Southeast	1583	30.3%	841.2	2149.0		777.5	2163.8		-63.8	2019.9	
South	1008	19.3%	316.3	680.0		408.2	1123.3		91.9	809.5	
Total	5229	100.0%	525.3	1431.0		506.4	1477.0		-18.9	1346.8	

*Kruskal-wallis test
** In July 30 2017 1US$=5.17 RS$

Table 4 – Mean and standard-deviation (stdDev) of completed treatments rate before (March 2019 – February 2020) and during (March 2020 – February 2021) COVID-19 pandemic according to several characteristics at city level (n=5229).

	Total		Annual rate of completed treatments before pandemic			Annual rate completed treatments during pandemic			Rate diference		
	n	%	Mean	StdDev	P-values*	Mean	StdDev	P-values*	Mean	StdDev	P-values*
City size (thousands) in 2020											
<10 inhab	2225	42.6%	2303.0	4262.2	<0.01	2672.3	5428.0	0.04	369.3	5971.8	<0.01
11 - 20 inhab	1289	24.7%	1747.7	2534.5		1798.3	3053.5		50.6	3294.1	
21 - 50 inhab	1058	20.2%	1611.1	2173.3		1609.8	2643.2		-1.3	2731.4	
51 - 100 inhab	338	6.5%	1219.1	1521.3		1365.5	1965.1		146.3	1920.6	
>100 inhab	319	6.1%	668.0	936.7		1136.8	1643.8		468.8	1573.6	
*Gross domestic product per capita in 2017***											
US$ <= 5.177	2701	51.7%	2044.8	3516.5	<0.01	1982.8	4294.6	<0.01	-61.9	4703.8	<0.01
US$ > 5.177	2528	48.3%	1655.0	2967.3		2150.1	3919.5		495.2	4135.7	
Coverage of Primary dental care in 2019 (oral health teams in the family health strategy per 100 thousand inhabitants)											
0 - 10	860	16.4%	867.4	1902.6	<0.01	1239.9	2383.3	<0.01	372.5	2636.8	<0.01
11 - 20	840	16.1%	1127.8	1854.7		1403.9	2362.2		276.1	2418.9	
21 - 30	1102	21.1%	1580.7	2082.5		1806.5	3052.4		225.8	3012.0	
31 - 40	1134	21.7%	2162.4	3137.9		2382.5	4007.6		220.1	4435.7	
>40	1293	24.7%	2953.9	4888.5		2980.0	6121.5		26.1	6822.3	
Dental Specialities Centers											
None	4280	81.9%	1902.3	3443.2	0.05	2127.1	4372.3	<0.01	224.8	4710.6	0.59
>0	949	18.1%	1649.0	2309.2		1777.8	2669.9		128.8	2978.5	
Municipal Human Development Index in 2010											
41.8 – 61.9 (very low/low)	1370	26.2%	2002.8	3066.9	<0.01	1312.3	2662.6	<0.01	-690.4	3386.6	<0.01
62.0 – 70.1 (medium)	2084	39.9%	1898.3	3362.9		2378.9	4797.7		480.7	4955.8	
70.2– 86.2 (high/very high)	1771	33.9%	1693.9	3303.2		2278.4	4111.7		584.5	4445.0	

Income distribution in 2010 (0 = equal; 1= completely unequal)											
<= 0.45	1394	26.7%	2242.8	4519.7	0.03	3007.6	5806.8	<0.01	764.8	6284.2	<0.01
0.46 – 0.54	2706	51.7%	1731.8	2642.8		1935.4	3548.1		203.5	3736.4	
>= 0.55	1121	21.4%	1672.7	2701.9		1209.3	2216.5		-463.4	2929.7	
Public Policy Score											
Better than National Median	2562	49.0%	2202.2	3920.2	<0.01	2775.6	5153.8	<0.01	573.4	5536.7	<0.01
Worse than National Median	2613	50.0%	1517.8	2384.0		1360.7	2554.1		-157.1	2905.6	
Hospitalization rate due to COVID-19 per 100 thousand inhabitants (March 2020- February 2021)											
None	2989	57.2%	2093.7	3733.7	<0.01	2362.7	4872.6	0.44	269.1	5221.7	<0.01
0-100	1082	20.7%	1667.4	2788.3		1665.8	2882.8		-1.6	3376.0	
>100	1158	22.1%	1420.3	2150.7		1663.8	2646.4		243.5	2867.5	
Geographical Region											
Middle-west	444	8.5%	1801.9	2993.6	<0.01	1573.8	2717.8	<0.01	-228.2	3284.1	<0.01
Northeast	1770	33.8%	2077.8	2971.4		1271.5	2407.8		-806.3	3052.8	
North	424	8.1%	1516.0	2619.9		1169.1	2164.4		-347.0	3017.1	
Southeast	1583	30.3%	2036.1	4146.4		3625.2	5924.5		1589.1	6168.0	
South	1008	19.3%	1352.3	2379.2		1594.8	3449.0		242.4	3594.3	
Total	5229	100.0%	1856.3	3268.1		2063.7	4117.9		207.4	4446.5	

*Kruskal-wallis test
**In July 30 2017 1US$=5.17 RS$

Table 5 – Odds ratio and 95% confidence interval (IC95%) of decreasing referrals to dental centers rates and decreasing completed treatment rates at city-level factors in multiple stepwise logistic regression analysis (n=5229).

	Referrals to dental centers			*Completed treatments*		
	OR*	IC95%		OR*	IC95%	
City size (thousands) in 2020						
<10 inhab	1			1		
11 - 20 inhab	1.39	1.20	1.62	1.00	0.87	1.16
21 - 50 inhab	1.49	1.24	1.78	1.25	1.06	1.46
51 - 100 inhab	1.61	1.21	2.14	1.13	0.88	1.45
>100 inhab	1.73	1.25	2.38	0.80	0.61	1.03
Geographical Region						
Southeast	1			1		
Middle-west	0.87	0.70	1.09	2.40	1.93	3.00
Northeast	1.09	0.90	1.33	3.57	2.95	4.33
North	0.75	0.59	0.96	2.26	1.78	2.88
South	0.54	0.45	0.65	1.78	1.50	2.12
Municipal Human Development Index in 2010						
41.8 – 61.9 (very low/low)	1			1		
62.0 – 70.1 (medium)	1.28	1.08	1.52	0.95	0.80	1.14
70.2– 86.2 (high/very high)	1.33	1.05	1.69	0.79	0.62	1.01
*Gross domestic product per capita in 2017***						
US$ <= 5.177	1			1		
US$ > 5.177	1.18	1.00	1.39	0.86	0.73	1.01
Coverage of Primary dental care in 2019 (oral health teams in the family health strategy per 100 thousands inhabitants)						
0 - 10	1			-		
11 - 20	1.24	1.01	1.53	-	-	-
21 - 30	1.35	1.10	1.67	-	-	-

31 - 40	1.49	1.19	1.85	-	-	-
>40	1.52	1.21	1.91	-	-	-
Dental Specialities Centers						
None	1			-		
>0	1.80	1.50	2.16	-	-	-

*all variables mutually adjusted
** In July 30 2017 1US$=5.17 RS$

The RECORD statement – checklist of items, extended from the STROBE statement, that should be reported in observational studies using routinely collected health data.

	Item No.	RECORD items	Location in manuscript where items are reported
	1	RECORD 1.1: The type of data used should be specified in the title or abstract. When possible, the name of the databases used should be included.	Data were extracted from health information systems at municipal level. (*page 2*)
		RECORD 1.2: If applicable, the geographic region and timeframe within which the study took place should be reported in the title or abstract.	Difference rates of procedures between twelve months before and during the COVID-19 pandemic were calculated, including only municipalities that provided some care for dental urgency at baseline period (n=5229 municipalities out of 5570). *(page 2)*
		RECORD 1.3: If linkage between databases was conducted for the study, this should be clearly stated in the title or abstract.	Data were extracted from health information systems at municipal level. (*page 2*)
Participants	6	RECORD 6.1: The methods of study population selection (such as codes or algorithms used to identify subjects) should be listed in detail. If this is not possible, an explanation should be provided.	This is an ecological longitudinal study using all Brazilian municipalities as the units of analysis. Comparisons were made between two periods: (a) before (March 2019 to February 2020) and (b) during (March 2020 to February 2021) the COVID-19 pandemic, including only municipalities that provided some care for dental urgency at baseline period (n=5229 municipalities out of 5570). *(page 4)*

		RECORD 6.2: Any validation studies of the codes or algorithms used to select the population should be referenced. If validation was conducted for this study and not published elsewhere, detailed methods and results should be provided.	This is an ecological longitudinal study using all Brazilian municipalities as the units of analysis. Comparisons were made between two periods: (a) before (March 2019 to February 2020) and (b) during (March 2020 to February 2021) the COVID-19 pandemic, including only municipalities that provided some care for dental urgency at baseline period (n=5229 municipalities out of 5570). *(page 4)*
		RECORD 6.3: If the study involved linkage of databases, consider use of a flow diagram or other graphical display to demonstrate the data linkage process, including the number of individuals with linked data at each stage.	Not applicable
Variables	7	RECORD 7.1: A complete list of codes and algorithms used to classify exposures, outcomes, confounders, and effect modifiers should be provided. If these cannot be reported, an explanation should be provided.	The difference was dichotomized, and municipalities were classified as "reduction" (code=1) or "increase/stable" (code=0). *(page 4)* The hospitalizations rates due to COVID-19 per 100.000 inhabitants, were classified in "none", “zero to one hundred (0-100)” and "more than one hundred (>100)". *(page 4)* HDI is calculated at the municipal level based on the 2010 census and was classified in “very low/low (41.8 – 61.9)”, “medium (62.0 – 70.1)” and “high/very high (70.2 – 86.2)”. *(page 4)* Gini distribution was collected also based on the 2010 census and was classified in three categories (>=0.45; 0.46-0.54;

			>=0.55) where zero means equal distribution and 1 completely unequal distribution. *(page 4-5)* Broad public policies was dichotomized in the national median values; city size was classified in five categories according to the number of inhabitants (<10, 10-20, 20-50, 50-100 or >100 thousands); the five Brazilian geographical regions were considered (Middle-west, Northeast, North, Southeast, South); coverage of primary dental services were classified in five categories (0-10; >10-20; >20-30; >30-40; >40), according to the number of oral health teams in family health strategy per 100 thousand inhabitants; and, the specialities centers data were dichotomized in "none" or "greater than zero (>0)". *(page 5)*
Data access and cleaning methods		RECORD 12.1: Authors should describe the extent to which the investigators had access to the database population used to create the study population.	Data were extracted from free access secondary databases, including the Primary Health Care Information System (SISAB), Ambulatory Information System (SIA-SUS), Hospital Information System (SIH), Brazilian Institute of Geography and Statistics (IBGE) and National Register of Health Facilities (CNES). Those databases are official sources of information made available by Federal agencies through their websites. *(page 4)*

		RECORD 12.2: Authors should provide information on the data cleaning methods used in the study.	Not applicable
Linkage		RECORD 12.3: State whether the study included person-level, institutional-level, or other data linkage across two or more databases. The methods of linkage and methods of linkage quality evaluation should be provided.	All information was extracted at the city level. *(page 4)*
Participants	13	RECORD 13.1: Describe in detail the selection of the persons included in the study (*i.e.,* study population selection) including filtering based on data quality, data availability and linkage. The selection of included persons can be described in the text and/or by means of the study flow diagram.	Not applicable
Limitations	19	RECORD 19.1: Discuss the implications of using data that were not created or collected to answer the specific research question(s). Include discussion of misclassification bias, unmeasured confounding, missing data, and changing eligibility over time, as they pertain to the study being reported.	Despite the important contribution of this investigation, available health system databases contains notification errors and missing reports, that increased standard-deviation. *(page 7)*
Accessibility of protocol, raw data, and programming code		RECORD 22.1: Authors should provide information on how to access any supplemental information such as the study protocol, raw data, or programming code.	No supplemental information was provided.

*Reference: Benchimol EI, Smeeth L, Guttmann A, Harron K, Moher D, Petersen I, Sørensen HT, von Elm E, Langan SM, the RECORD Working Committee. The REporting of studies Conducted using Observational Routinely-collected health Data (RECORD) Statement. *PLoS Medicine* 2015; in press.

*Checklist is protected under Creative Commons Attribution (CC BY) license.

4 CONSIDERAÇÕES FINAIS

O caos instaurado pela pandemia do SARS-COV-2 chegou de maneira abrupta na vida da humanidade. A compreensão da organização dos centros de saúde durante essa situação de calamidade para o atendimento das urgências odontológicas, a partir da análise do número de tratamentos concluídos e dos encaminhamentos realizados para centros especializados pode contribuir com a implementação de novas políticas públicas, assim como com o direcionamento do financiamento das mesmas. O entendimento das diferentes demandas considerando todas as regiões do Brasil pode direcionar os investimentos futuros na saúde pública, visando atingir condições semelhantes de acesso em todas as regiões. Tais ações poderão preparar melhor o Brasil para futuras situações de calamidade que possam surgir. Baseados nos dados do presente estudo, juntamente com os que tem sido reportado na literatura, o momento atual deve concentrar esforços para que a demanda de atendimento em saúde possa ser atendida e suprida da melhor forma possível.

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