Original Research Article

The impact of the COVID-19 pandemic on SUS (Universal Health System) primary preventive dental care in Brazil during the first two years of the pandemic

Abstract

Objective: Public health in Brazil has witnessed substantial transformations over the past four years due to the impact of the COVID-19 pandemic. The objective of this study was to assess the number of dental preventive procedures performed in the Brazilian Public Health System (SUS) during the first two years of COVID-19 in Brazil (2020/21) and compare it with the same period of two previous years (2018/19).

Methods: Data were retrospectively obtained from the Outpatient Information System (SIA/SUS) and the Brazilian Institute of Geography and Statistics (IBGE). Annual and total procedure numbers for 3 variables were established in each region. The indicators were: Educational activity/guidelines for groups in primary care, collective action of fluoride mouthwash and collective action of supervised toothbrushing. Descriptive analysis with annual percentage change (APC) was used.

Results: The preventive procedures decreased from 2018 to 2021, drastically dropping from 2020 to 2021. There was a 54% reduction in educational activity/guidelines for groups in primary care. There was a drastic reduction in the collective actions of fluoride mouthwash and supervised toothbrushing.

Conclusion: Dental preventive procedures in the SUS decreased from 2018 to 2021, but a greater decrease was observed in the first two years of the pandemic.

Keywords: Dentistry. Pandemics. COVID-19. Unified Health System. Public Health

INTRODUCTION

Public health in Brazil has undergone significant changes in recent decades, but it has undoubtedly never been as overwhelming as the pandemic caused by COVID-19. Almost five years and more than 700,000 deaths later, it is possible to say that Brazilian public health suffered a big blow, which, despite everything, continues to resist. One of the pillars of this resistance is the combed Family Health teams, an integral part of the Family Health Program (FHP). The FHP was created to contribute to reorganizing health care prioritizing health prevention, promotion, and recovery actions.[1-4] With the advancement of these public policies, dentistry was more significant in teams, with a consequent focus on collective procedures aimed at visiting oral health prevention.

Some preventive dental procedures of oral health teams are focused on children, with educational activities such as supervised toothbrushes and topical fluoride applications via monitored mouthwash. These educational activities are mainly carried out within municipal and state public schools during the class period. Oral health education within schools deserves to be highlighted, as it has a low cost and a great possibility of dental impact at the public and collective level.[5]

As a measure of containment of the dissemination and transmission of the virus, in March 2020, there was a suspension of the present classes and the closure of schools. Each municipality had the autonomy to order this closure most conveniently. Also, in March 2020, the Ministry of Health issued a technical note (n.9/2020) whose primary orientation was suspending elective SUS dental care, maintaining only the maintenance of urgent cases, which should be carried out individually to avoid disseminating the virus.[6] Collective procedures are applied primarily in elementary schools, and it is believed that the permanence and frequency of these procedures in the school environment, coupled with other factors, contributes to caries rates in children being controlled.[7] With these social

isolation and distancing measures, collective prevention dental procedures fell dramatically during 2020 and early 2021.

The impacts of these actions were widely studied during the year 2020.[8-10] However, most of these studies evaluated the effect that quarantines and elective care suspensions have generated on private dental services. Much remains to be understood about these suspensions' impact on dental care provided by the Unified Health System (SUS), particularly concerning collective preventive procedures.

Access to health services is still precarious for many of the Brazilian population.[11] In this context, access to oral health has been related as a gateway to a health care service.[12] Many children find in these collective educational activities that they only have access to oral health care information and weekly brushing.

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According to Chisini *et al.*[1], collective procedures have decreased in recent years. Lucena *et al.*[13] reported that access to oral health in primary care was reduced due to the Covid-19 pandemic. However, they did not evaluate how exactly the collective procedures decreased by the Covid-19 pandemic. Based on this information, this paper aims to assess the impact that the COVID-19 pandemic has exerted on joint preventive dental procedures performed in SUS.

MATERIAL AND METHODS

A retrospective longitudinal ecological study was conducted using secondary public data from the Brazilian Institute of Geography and Statistics (IBGE) and DATASUS.[14]

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This report adheres to the guidelines outlined in the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement.[15]

Source:

The data was obtained from DATASUS with the TABNET tool, which offers information to facilitate an objective analysis of the healthcare system, inform evidence-based decision-making, and aid in developing health action programs.[16] Data extraction was conducted independently by two investigators

who had been previously trained and calibrated (ACC and TF). The method was based on a previous study.[16]

Data acquisition

A search comprising provided dental treatments and the SUS codes related to any dental preventive procedures provided by SUS at outpatient settings (patients who did not require an overnight hospital stay but visited a hospital, clinic, or affiliated facility for diagnosis or treatment) was performed from 2018-2021. Data was collected on June 6th, 2020.

The categories of preventive dental procedures were the following variables: Educational activity/guidelines for groups in primary care, Collective action of fluoride mouthwash, and Collective action of supervised toothbrushing. Their definitions and additional information are in Table I.

Educational activity/guidelines for groups in primary care (code: 0101010010)	Educational activities (presentations) on health promotion and prevention actions conducted in a group setting. A minimum of 10 (ten) participants is recommended, with a minimum duration of 30 (thirty) minutes. The number of activities carried out per month should be recorded.
Collective action of fluoride mouthwash (code: 0101020023);	Mouth washing with a fluoride solution, conducted by population groups under the guidance and supervision of one or more healthcare professionals, weekly (0.2% NaF) or daily basis (0,05% NaF)
Collective action of supervised toothbrushing (code: 0101020031).	Dental brushing is conducted with population groups under the guidance and supervision of one or more healthcare professionals. Action is recorded by the user per month, regardless of the frequency at which it is performed (daily, weekly, bi-weekly, monthly, or two, three, or four times a year).

Table I: Preventive Dental Procedures Description

A descriptive analysis was conducted to determine the number of procedures performed in each state, along with their relative percentages within

Brazil's socio-demographic regions (South, Southeast, Northeast, North, and Midwest)

RESULTS

Overall, the total number of preventive procedures decreased from 2018 to 2021 (Table II), with a drastic drop in 2020 compared to 2019 (Figure 1).

There was a decrease in all evaluated preventive procedures from 2018 to 2021 (Table II and Figure 2A-C). Fluoride mouthwash and supervised toothbrushing showed a reduction of approximately 90% in the first two years post-pandemic compared to the two years before the emergence of COVID-19 (Figure 2B-C).

Educational activity/guidelines for groups in primary care showed a decreased rate in all regions in the evaluated periods (Table III). The exceptions occurred in the Southeast Region (+25.41%) and in the Southern region (+8.69%), where there was an increase in the period 2020-2021 (Table III).

The Collective action of fluoride mouthwash showed a discreet increase in the Southern region (+1.19%) from 2018-2019. All other periods evaluated demonstrated a decrease rate, more pronounced after 2019-2020 (Table III). Brazil's total data showed a reduction of -98.48% in 2018-2021(Table III).

The Collective action of supervised tooth brushing presented a decrease rate in 2018-2021 of -96.37% (Table III). All rates evaluated showed a decrease in all periods, mainly 2019-2020 (Table III).

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DISCUSSION

The COVID-19 pandemic has profoundly impacted dental care worldwide.[17] In Germany, where a tendency to postpone dental care was observed, approximately 20% of Germans opted to delay their consultations during the pandemic despite the relatively shorter duration of restrictions.[18] Similarly, in China, the pandemic led to a significant reduction in dental emergency care utilization due to medical advice and fear of contamination. The closure of conventional care facilities during this period further exacerbated the population's decline in oral health management.[19]

In England, a country severely affected by COVID-19, public health services initially focused solely on urgent care for patients who could not be monitored remotely. Even after clinical activities were restored, a notable 67% decline in service utilization was observed in October 2020 compared to the same month in 2019.[20]

These findings highlight the wide-ranging impact of the COVID-19 pandemic on dental care utilization across different countries. The postponement of consultations, reduced access to emergency care, and decline in routine dental services emphasize the importance of tailored strategies to address oral health challenges during global health crises.

This research examines the impact of the COVID-19 pandemic on dental care indicators in the public healthcare system in Brazil. The study focuses on the period between 2018 and 2021, revealing noteworthy trends and disparities in preventive dental services utilization among the population.

All prevention indicators evaluated in the public service declined from 2018 to 2019, followed by a sharp drop in 2020 and further deterioration in 2021 (Table II). Given that the public service is primarily accessed by individuals with lower income and limited access to private dental care, it is evident that a significant portion of the population, particularly children, experienced substantial setbacks in their dental control and prevention, including issues like caries and periodontal disease.

Educational Activities specifically tailored for children to introduce them to oral hygiene and its significance experienced a decline from 2018 to 2021. However, this indicator demonstrated relative resilience compared to others during the pandemic. Despite decreasing by more than half during the evaluated time frame, these activities were vital in mitigating cleaning deficiencies among children.

In contrast, Fluoridated Mouthwash and supervised tooth Brushing indicators faced severe challenges. These indicators showed a modest decline between 2018 and 2019, but the situation worsened significantly between 2019 and 2020. Fluoridated Mouthwash utilization plummeted by 90.14%, while supervised tooth Brushing frequency dropped by 88.16%. The decline continued from 2020 to 2021, with Fluoridated Mouthwash witnessing an 80.82% decrease and supervised tooth Brushing showing a drop of 58.99% (Table II).

When we evaluate the independent individuals through each region of Brazil, we can see that virtually all indexes had a percentage decrease in the assessed periods (Table III). Notably, the Educational Attitude - Group Orientation Indicator (table III) was the least affected in the period valued between 2018 and 2021 but still had a sharp drop in all regions of the country. The Southeast region was the least affected region, with a total reduction of 35.31% in the period (Table III). This region is considered the country's wealthiest region, where the public health system receives more significant investment in the state, which contributes substantially to the effectiveness of its service.

However, the Fluorided Mouthwash (Table III) and Supervised tooth brushing Brushing (Table III) indicators showed a substantial drop in all regions. In both indicators, the region with the highest decrease was the southern region, with a decline of –96.32% (Table III) and –94.03% (Table III), respectively. The region with lower falls, even if substantial, was the northern region, with falls of -87.14% (Table III) and -91.78% (Table III), respectively. However, it is noteworthy that there is a significant population difference between these two regions. The Northern Region, according to the latest census,[14] in 2022, has a total population of 17,349,619, while the Southern region has a population of 29,933,313 inhabitants. This data shows that the three states in the southern region have 57.96% more inhabitants than the seven states in the northern region, and this population volume in a smaller area also helps to explain the most significant drop in data in the southern region.

The decrease observed between 2019 and 2018 is probably due to the transition from the federal government and changes in public oral health policies that usually occur in changes of governments. However, the decrease was significantly noticeable compared to the initial two years of the pandemic.

It is known that the people served by the FHP are among those with the lowest socioeconomic level and do not have private health insurance.[21] A study by Goldbaum et al.[22] showed that of the population seeking care at FHP, 42.9% comprises inactive people, unemployed people, and informal workers, a higher number than the number of employed people seeking this same service (11.8%).

These data show us that the FHP service plays a fundamental role in the oral health of people who are most likely to be most affected by health problems precisely because they have less financial means to prevent health problems, as

can be done by people from lower social classes, who can seek private or health insurance services more regularly.[23]

When this neediest population does not seek FHP care due to the restrictions caused by COVID-19, we can understand that their only source of prevention has also been restricted, and, therefore, we can assume that this period without care will lead to repercussions on the health of this population, which will be seen in the years following the end of restrictions. With less preventive care, we tend to have more demand in the future for patients in emergencies due to pain or other oral problems.

A worldwide atypical situation such as a pandemic would be sufficient reason to generate fear and insecurity in the population, and the restriction orders added to the massive isolation campaigns aimed at preventing COVID-19 virus propagation in the falls presented in this study. However, it is still worth noting that the long-term effects on the oral health of young people will undoubtedly be considerable and can only be fought with a national public and oral health policy with significant investments.

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CONCLUSION

The COVID-19 pandemic strongly impacted the dental prevention indicators of the public health network (SUS) from 2020, extending this fall to 2021. As a consequence of this decrease in preventive actions, there will be greater demand for corrective treatments in the coming years.

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Figure 1: Total preventive dental procedures from 2018 to 2021.

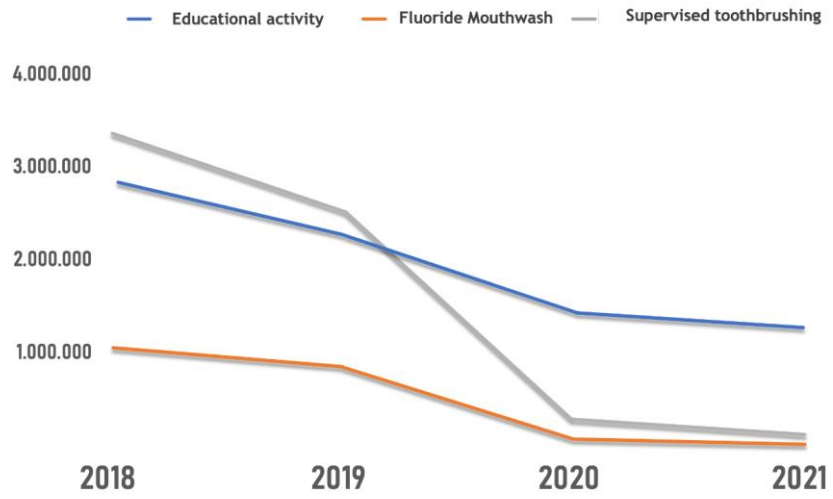
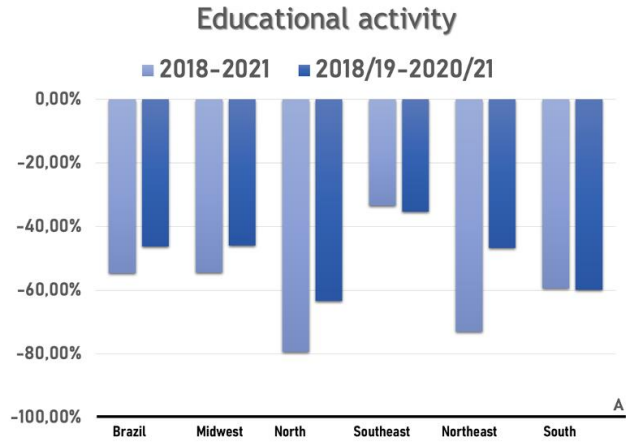
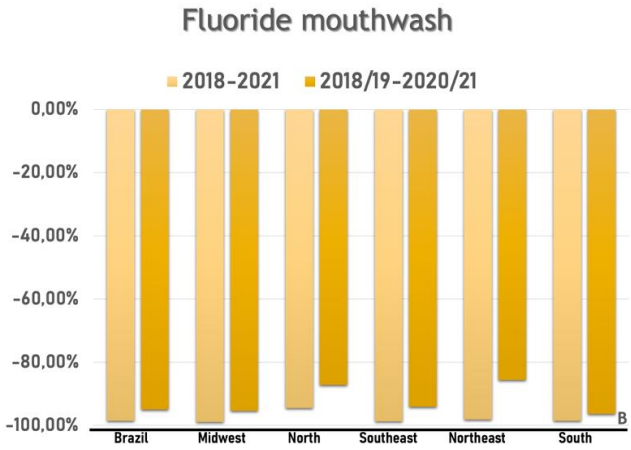


Figure 2(A-C): Decrease Rate of preventive procedures from 2018-2021 (A: Educational activity/guidelines for groups in primary care; B: Collective action of fluoride mouthwash; C: Collective action of supervised toothbrushing)


Educational activity
2018-2021
2018/19-2020/21
0,00%
-20,00%
-40,00%
-60,00%
-80,00%
-100,00%
A
Brazil
Midwest
North
Southeast
Northeast
South


Fluoride mouthwash
2018-2021
2018/19-2020/21
0,00%
-20,00%
-40,00%
-60,00%
-80,00%
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B
Brazil
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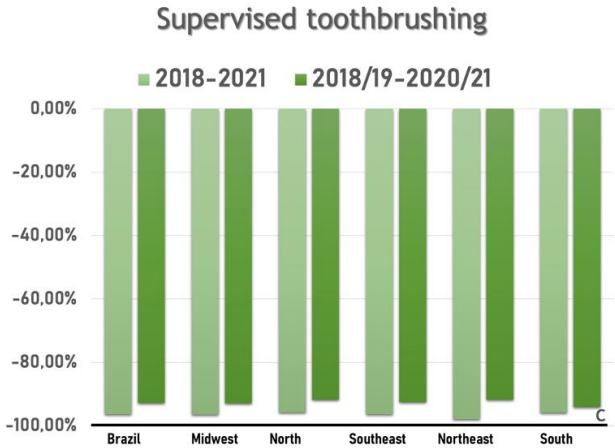
South


Supervised toothbrushing
2018-2021
2018/19-2020/21
0,00%
-20,00%
-40,00%
-60,00%
-80,00%
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C
Brazil
Midwest
North
Southeast
Northeast
South

Table II. Total preventive procedures from 2018 to 2021

Colective procedures	2018	2019	2020	2021
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Educational activity	2.831.005 (1.809.693)	2.291.220 (1.519.383)	1.452.148 (1.068.321)	1.285.271 (1.376.459)
Fluoride mouthwash	1.065.494 (1.130.760)	862.068 (1.249.100)	84.990 (66.222)	16.299 (15.855)
Supervised toothbrushing	3.378.575 (3.313.621)	2.520.988 (2.704.435)	298.380 (316.501)	122.358 (127.527)

Table III. Total and regional variation in Preventive dental procedures from 2018 to 2021

Region	2018-2019 (%)	2019-2020 (%)	2020-2021 (%)	2018 - 2021 (%)	2018/19-2020/21(%)
Educational activity/guidelines for groups in primary care					
Brazil	-20%	-35%	-11.5%	-54.6%	-46.27%
Midwest	-21.24%	-35.21%	-10.68%	-54.41%	-45.96%
North	-22.6%	-47.72%	-53.3%	-79.35%	-63.41%
Southeast	-15.01%	-37.53%	+25.41%	-33.43%	-35.31%
Northeast	-35.45%	-5.88%	-55.55%	-73.01%	-46.67%
South	-5.63%	-60.37%	+8.69%	-59.37%	-59.86%
Collective action of fluoride mouthwash					
Brazil	-19.78%	-90.13%	-80%	-98.48%	-94.95%

Midwest	-12.47%	-91.31%	-85.41%	-98.89%	-95.35%
North	-90.98%	-5.72%	-35.15%	-94.48%	-87.14%
Southern	-42.73%	-85.87%	-84.11%	-98.71%	-94.08%
Northeast	-71.39%	-41.66%	-88.82%	-98.13%	-85.57%
South	+1.19%	-94.14%	-75.37%	-98.54%	-96.32%
Collective action of supervised toothbrushing					
Brazil	-25.38%	-88.16%	-58.99%	-96.37%	-92.86%
Midwest	-6.57%	-89.13%	-65.30%	-96.47%	-92.86%
North	-49.88%	-83.78%	-47.72%	-95.76%	-91.78%
Southern	-20.84%	-87.68%	-62.35%	-96.33%	-92.51%
Northeast	-51.68%	-79.04%	-79.79%	-97.95%	-91.79%
South	-23.73%	-91.56%	-36.44%	-95.91%	-94.03%