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Original Research Article

The access carried out in oral health services post-COVID-19 pandemic: a temporal analysis of the SIA-SUS in Jaboatão dos Guararapes

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ABSTRACT

Background: Aim of the study was to evaluate the access provided, represented by the use of dental services, by users of the unified health system (SUS), in Jaboatão dos Guararapes (PE), during the COVID-19 pandemic.
Methods: Time series analysis of data on dental activities and procedures carried out by dentists registered in the SUS ambulatory information system (SIA-SUS), between January and December, from 2013 to 2022, as a way of characterizing the access carried out, a characteristic of use of services.
Results: The data reveal that there was a reduction in the supply of dental care in all categories during the COVID-19 pandemic, especially in the first two years: 2020 and 2021.
Conclusions: The data analyzed corroborate the perception that the restrictions imposed on care dental services offered by the unified health system had a negative impact on health services in the municipality of Jaboatão dos Guararapes (PE).

Keywords: Oral health, COVID-19, Health services accessibility, Dentistry

INTRODUCTION

Since 2020, COVID-19 has influenced health systems around the world, causing problems for managers, professionals and users. Among the reasons observed, there is a lack of knowledge about the disease and possible treatments, unpreparedness of health systems to meet growing demand, as well as incompetence on the part of managers to deal with the financial and political crises that have arisen during the process.[1,2]

As far as dentistry is concerned, the patient becomes a potential agent of contamination on a large scale, because the virus remains in the larynx for up to 28 days after infection.[3-5] An aggravating factor is the transmission of the disease through the air and the characteristics of dental treatments carried out with equipment that releases aerosols and thus spreads the microorganisms that cause the disease into the air.[5]

The consequences of COVID-19 include the transfer of financial resources and the mobilization of health professionals to treat people affected by the disease, causing complications in other areas, such as dentistry.[2] In addition, waiting lists for dental care have grown as oral diseases have become more complicated. Allied to the growing difficulty of getting care, the fear of contamination in the dental environment made self-medication more frequent during the period of greatest intensity of the disease. With immediate pain relief, the solution to the problem is postponed, causing greater loss of dental elements.[6]

In Brazil, access to oral health care received significant investment from the federal government between 2003-2010, then stagnated between 2011 and 2018, with a decline from 2018 onwards due to the financial crisis that hit the country. This led to lower financial transfers from the federal government to the states and, as a result, less investment in various sectors, including oral health.[7] This

led to a shortage of resources, limiting the supply of services and, consequently, the number of procedures carried out, including important markers such as the first dental appointment.[7,8] Studies carried out before the COVID-19 pandemic showed that access to oral health was unequal, whether due to cultural or financial factors or even the population's level of education. In addition, personal characteristics such as gender, age and color affect access to oral health.[9]

In Pernambuco, the municipality of Jaboatão dos Guararapes, in the metropolitan region of Recife, has an estimated population of 711,330 inhabitants in 2021 and has recorded more than 52,000 cases of COVID-19, of which more than 51,000 have been recovered, with around 1,850 deaths, with a fatality rate of 4.78%, more than double that of the state and the country.[10] During the pandemic period, it ranked second in terms of gross domestic product (per capita (2019) of R$19,750.50), just behind the state capital.[11]

Given this scenario of lack of funding and the pandemic, it is worth evaluating the access provided, represented by the use of dental services, by users of the unified health system (SUS), in Jaboatão dos Guararapes (PE), during the COVID-19 pandemic.

METHODS

This is a time series or historical analysis, which allows estimates to be made and the behavior of a series to be evaluated, in this case dental procedures.[12] The SUS outpatient information system (SIA-SUS) was used to collect data on dental activities and procedures carried out by dentists registered with the SUS between January and December 2013 and 2022, as a way of characterizing access, a characteristic of service use. It should be noted that the use of services relates to individual determinants, as well as health systems and the social context.[13]

The municipality in question has 88 oral health teams, spread across seven regional health centers. According to the national register of health establishments (CNES), 297 dental surgeons work in the municipality for the SUS; of these, 73 work in PHC.[14]

The most frequent procedures performed by dentists were selected and classified into two categories: 1- emergency dental care; 2-non-urgent dental care. This classification is recommended by the American dental association for dental care during the COVID-19 pandemic.[15]

Based on the number of procedures from 2013 to 2022, the behavior of the historical series in the period was described, considering the total number of dental procedures. They were also stratified by emergency and elective procedures. In all the analyses, the annual variation was calculated, taking the year in which the series began (2013) as the reference year. In addition, the year 2019 was adopted as a reference for normality because it is the immediate pre-pandemic year of COVID-19. Variations were calculated using the formulas: Variation=((Nano- N2013)/ N2013) × 100; and variation=((Nano-N2019)/ N2019r) × 100. The frequency distributions of the types of elective and emergency procedures performed in the pre-pandemic period (2013 to 2019) and in the pandemic years (2020 to 2022) were described. The analysis was carried out using STATA software version 14. The study has no ethical implications, in accordance with CONEP resolution 510/16.[16]

RESULTS

Over the 10 years analyzed (2013 to 2022), 30,844 dental procedures carried out in primary care in the municipality of Jaboatão dos Guararapes (PE) were recorded in the SIA-SUS. The procedures are registered as urgent and non-urgent. Of the total, 29,860 procedures were elective, which is equivalent to 97% of the procedures (Table 1).

For this study, the years 2013, as the initial event in the series, and 2019, as the period with the highest number of procedures carried out in the entire series, were taken as reference, when 4,576 dental procedures were carried out. The data shows that there was a continuous increase in the number of procedures carried out until 2019, with a 90.7% increase. In 2020, the start of the COVID-19 pandemic, there was a 48.9% reduction compared to 2013 and a 73.2% reduction compared to 2019. The years 2021 and 2022 saw an increase in the number of procedures compared to 2020. However, 2021 saw a 60.2% reduction in procedures when compared to 2019. 2022, on the other hand, was 33.7% lower than 2019, although it exceeded the number of procedures carried out in 2013.

The data shows that there was a reduction in the supply of dental care in all categories during the COVID-19 pandemic, especially in the first two years: 2020 and 2021. However, there was an increase in the number of urgent procedures carried out during this period, compared to the entire pre-pandemic period. In 2020, the percentage of emergency consultations was 6.6%; in 2021 it was 22.5%, and in 2022 it was 15.2%.

Elective dental consultations and procedures fluctuated over the 10 years. With the greatest reduction in 2020 and recovery from 2021 onwards, reaching third highest level in series in 2022, when amount was 3,034 procedures.

With regard to elective procedures, analysis shows that there was a progressive increase in the number of procedures until 2019, with a 90.2% increase compared to 2013. With the COVID-19 pandemic, there was a 52.2% reduction in 2020 when compared to 2013, and 74.9% reduction when compared to 2019. Although years 2021 and 2022 showed upward trend, when compared to 2019, they fell by 69.1% and 43.6%, respectively (Figure 1).

Table 1: Distribution of elective and emergency procedures between 2013 and 2022, Jaboatão dos Guararapes, Pernambuco.

Reference year	General	Elective		Urgency	
		N	%	N	%
2013	2.399	2.399	100	0	0.0
2014	3.550	3.545	99.9	5	0.1
2015	3.433	3.433	100	0	0.0
2016	3.252	3.237	99.5	15	0.5
2017	4.046	4.045	100	1	0.0
2018	3.508	3.508	100	0	0.0
2019	4.576	4.564	99.7	12	0.3
2020	1.227	1.146	93.4	81	6.6
2021	1.819	1.409	77.5	410	22.5
2022	3.034	2.574	84.8	460	15.2
Total	30.844	29.860	96.8	984	3.2

Source: SUS outpatient information system (SIA-SUS). Own authorship.

Table 2: Frequency distribution of elective procedures performed in the pre-pandemic period (2013 to 2019) and in the pandemic years (2020, 2021 and 2022), Jaboatão dos Guararapes, Pernambuco.

Procedures	2013 to 2022		2013 to 2019		2020		2021		2022	
	N	%	N	%	N	%	N	%	N	%
Subgingival scraping and smoothing	508	23.5	625	17.9	268	23.4	426	30.3	715	27.8
Supragingival scraping, smoothing and polishing (per sextant)	380	17.6	1.011	29.0	123	10.7	172	12.2	215	8.4
Topical application of fluorine	311	14.4	471	13.5	256	22.3	239	17.0	278	10.8
Tooth restoration (permanent or deciduous)	302	14.0	564	16.2	203	17.7	85	6.0	358	13.9
Evidence of plaque	184	8.5	291	8.4	85	7.4	148	10.5	214	8.3
Permanent tooth extraction	176	8.2	97	2.8	86	7.5	116	8.2	408	15.9
Temporary sealing of dental cavities	75	3.5	131	3.8	24	2.1	85	6.0	62	2.4
First dental appointment program	37	1.7	100	2.9	38	3.3	5	0.4	5	0.2
Pulp capping	30	1.4	60	1.7	4	0.3	19	1.4	39	1.5
Sealant and cariostatic application	6	0.3	26	0.7	0	0.0	1	0.1	0	0.0
Collective action of fluoride application, brushing and oral hygiene guidance	7	0.3	23	0.7	0	0.0	1	0.1	5	0.2
Other procedures	143	6.6	59	5.1	112	8.0	275	10.7		

Source: SUS outpatient information system (SIA-SUS). Own authorship.

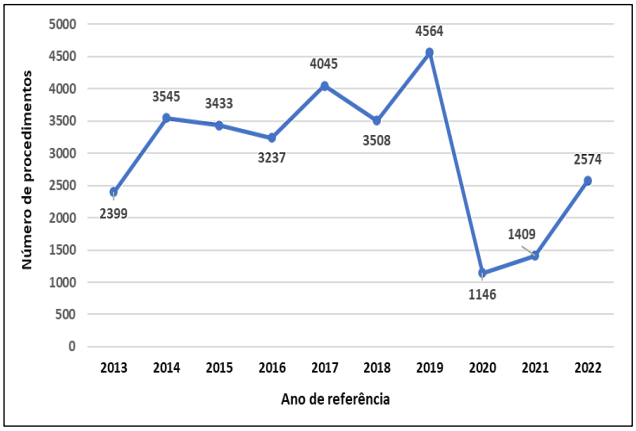

Figure 1: Number of elective and emergency procedures performed between 2013 and 2022. Jaboatão dos Guararapes, Pernambuco.

With regard to the average of the years analyzed, the 10 most performed elective procedures in the overall average, from 2013 to 2022, were: supragingival scraping, smoothing and polishing (per sextant), with 23.5%; subgingival scraping, smoothing and polishing (per sextant), with 17.6%; topical fluoride application, with 14.4%; restoration of permanent teeth, with 14%; followed by plaque detection, extraction of permanent teeth, temporary cavity sealing, first dental appointment, prophylaxis/plaque removal, pulp capping. The five most frequently performed procedures account for 81% of all elective procedures carried out in the municipality over the 10-year period (Table 2).

When comparing the pre-pandemic years (2013 to 2019) with the pandemic period (2020 to 2022), there was an increase in the number of restorations in 2020, with a reduction in the following years (2021-2022). There was

also an increase in sealant and cariostatic application procedures and collective action for fluoride application, brushing and oral hygiene guidance, with a reduction in pulp capping procedures.

The list of urgent procedures carried out in the municipality over the entire period analyzed (2013 to 2022) included only 10 items: atraumatic restorative treatment (ART), which represents 77.4% of urgent care; restoration of deciduous teeth (8.4%), restoration of permanent teeth (7%), treatment of pericoronaritis (3.4%); excision and/or suturing of small lesions on the skin or mucosa and appendages (1.8%). And the others, representing less than 1% of the total: supragingival scraping, smoothing and polishing (per sextant), excision and suturing of lesions in the mouth; plaque prophylaxis/removal; and treatment of acute necrotizing ulcerative gingivitis (Table 3).

Table 2: Frequency distribution of elective procedures performed in the pre-pandemic period (2013 to 2019) and in the pandemic years (2020, 2021 and 2022), Jaboatão dos Guararapes, Pernambuco.

Procedures	2013 to 2022		2013 to 2019		2020		2021		2022	
	N	%	N	%	N	%	N	%	N	%
Subgingival scraping and smoothing	508	23.5	625	17.9	268	23.4	426	30.3	715	27.8
Supragingival scraping, smoothing and polishing (per sextant)	380	17.6	1.011	29.0	123	10.7	172	12.2	215	8.4
Topical application of fluorine	311	14.4	471	13.5	256	22.3	239	17.0	278	10.8
Tooth restoration (permanent or deciduous)	302	14.0	564	16.2	203	17.7	85	6.0	358	13.9
Evidence of plaque	184	8.5	291	8.4	85	7.4	148	10.5	214	8.3
Permanent tooth extraction	176	8.2	97	2.8	86	7.5	116	8.2	408	15.9
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First dental appointment program	37	1.7	100	2.9	38	3.3	5	0.4	5	0.2
Pulp capping	30	1.4	60	1.7	4	0.3	19	1.4	39	1.5
Sealant and cariostatic application	6	0.3	26	0.7	0	0.0	1	0.1	0	0.0
Collective action of fluoride application, brushing and oral hygiene guidance	7	0.3	23	0.7	0	0.0	1	0.1	5	0.2
Other procedures	143	6.6	59	5.1	112	8.0	275	10.7		

Source: SUS outpatient information system (SIA-SUS). Own authorship.

Table 3: Frequency distribution of elective procedures performed in the pre-pandemic period (2013 to 2019) and in the pandemic years (2020, 2021 and 2022), Jaboatão dos Guararapes, Pernambuco.

Procedures	2013 to 2019		2020		2021		2022	
	N	%	N	%	N	%	N	%
Atraumatic restorative treatment	0	0.0	59	72.8	358	87.3	345	75.0
Deciduous tooth restoration	1	3.0	11	13.6	18	4.4	53	11.5
Permanent tooth restoration	3	9.1	5	6.2	17	4.1	44	9.6
Treatment of pericoronaritis	0	0.0	6	7.4	15	3.7	12	2.6
Simple excision and/or suturing of small lesions/ injuries to the skin/annexes and mucosa	18	54.5	0	0.0	0	0.0	0	0.0
Supragingival scraping, smoothing and polishing	6	18.2	0	0.0	0	0.0	0	0.0
treatment of oral mucosa lesions	0	0.0	0	0.0	2	0.5	4	0.9
Excision and suturing of lesions in the mouth	3	9.1	0	0.0	0	0.0	0	0.0
Plaque prophylaxis/removal	2	6.1	0	0.0	0	0.0	0	0.0
treatment of acute necrotizing ulcerative gingivitis	0	0.0	0	0.0	0	0.0	2	0.4

Source: SUS outpatient information system (SIA-SUS). Own authorship.

Between 2013 and 2019, only 33 emergency cases were recorded. However, this type of care increased exponentially in 2020 and 2021. The increase in emergency care in 2020, taking all care from 2013 to 2019 as a reference, was 145.5%. In 2021 the relative increase was 1,142%, and in 2022 the increase was 1,294%. Based on the previous year (2020), the increase in emergency care in 2021 was 406%, and from 2021 to 2022 the increase was 12.2%.

One point for reflection is the low number of urgent procedures registered between 2013 and 2019. During the ten years analyzed, 984 elective procedures were performed. This type of service is concentrated in 2022, when the average is 47%. One hypothesis is that this data is underreported. The data also shows that the three most performed procedures, ART, restoration of permanent and deciduous teeth, account for 93% of all procedures, and ART alone accounts for 83% of all emergency procedures.

DISCUSSION

Although there are positive aspects, such as actions to prevent periodontal diseases, the data suggests difficulties in use of oral health services by population. According to Andersen (1995), the actual use of health services depends on predisposing factors and the population's health needs, which together characterize access.[17]

The first dental appointment is an indicator of oral health and allows us to check access to sequential treatment.[18] However, it does not appear in the ranking of the most performed in the last 10 years in the municipality. This indicates that new users are not being attracted.

The extraction of permanent teeth is the sixth most common procedure. This is also an aggravating factor for oral health in the municipality. As it is a definitive and mutilating procedure, which affects chewing, speech and even the individual's psychosocial well-being, it should be performed as a last resort, when there is no other alternative such as restoring the tooth.[19,20] It should be noted that edentulism is considered a constantly growing public health problem that requires preventive action.

Pulp capping (PC) is a procedure that is only necessary when the caries lesion is deep enough to reach the dental pulp. And, although in 9th place, the fact that pulp capping is performed at all exposes the low capacity of the services, as they are unable to provide care at the moment the patient needs it in order to stop the caries disease from progressing. Since caries is a chronic disease that progresses slowly, it can be stopped with hygiene care and the restoration of the tooth.[21] Thus, the results show, once again, that access to oral health services has not been effective and timely.

In addition, the results indicate that, over the years studied, the municipality has not carried out collective health actions, such as topical fluoride application and supervised tooth brushing. These actions are usually carried out with pre-school children to reduce the risk of cavities and tooth loss due to lack of care in childhood.[18] These procedures are indicators of oral health. Indicators make it possible to observe the characteristics of individuals and serve to guide policies, as well as enabling governmental and/or institutional measures and, therefore, the planning of measures and actions.

With regard to the procedures listed as urgent, the guidelines for dental care in the context of COVID-19 provide for four major groups of care: emergencies, urgent care, essential elective care and extended care. During the first few months of the COVID-19 pandemic, care should be established within these groups, according to the epidemiological situation in each municipality.[22] It should be noted that emergency care would be the responsibility of the UPAS and hospitals. Other care would be the responsibility of primary care.[23]

In this way, primary care professionals-including family health units and basic health units-are responsible for providing emergency care in cases where there is a potential for the situation to worsen, but which do not pose a risk of death or where it may lead to the limitation of the individual's usual activities.[24]

As such, the following are considered emergency care acute odontogenic pain; pericoronaritis or pain related to infectious processes involving the retained third molars; alveolitis; dental or periodontal abscesses or bacterial infection, resulting in localized pain and edema; dental fracture resulting in pain or trauma to oral soft tissues; cementation of crowns or fixed prostheses; biopsies; adjustments of orthoses and prostheses that are causing pain and compromising masticatory function; opening or changing intracanal medication; removal of extensive caries lesions/restorations that are causing pain; treatment of tissue necrosis with pain and presence of purulent secretion; mucositis; dental trauma with avulsion or luxation.[25] These are all problems that can worsen an individual's health if they are not attended to in good time.

Thus, the availability of resources and trained professionals to carry out procedures is an important marker of access. In addition, users of health systems should be aware of the services available.[17] Especially in a pandemic context, where services are restricted and health problems can easily be aggravated by lack of access. It is therefore necessary to identify urgent and elective procedures.

Essential elective procedures are those where there is no risk of imminent death, but where prolonged postponement of care could have repercussions on general health. They are also those offered to specific groups such as pregnant women-prenatal dental care; diabetics; hypertensive patients and other systemic

conditions; and people with disabilities. Extended elective services, on the other hand, are those which, if postponed, do not cause great harm to the user.[23]

The federal council of dentistry (CFO) states that non-emergency dental procedures include the restoration of teeth, including the treatment of asymptomatic carious lesions, and dental procedures for aesthetic purposes.[26] Elective surgeries, tooth extraction and asymptomatic periodontal surgeries, implant dentistry, orthognathic surgeries and other surgeries that are not listed under urgencies and emergencies are procedures in which care can be scheduled without risk to the user's health. This group also includes initial consultations, routine X-rays, prophylaxis and orthodontic procedures not directly related to pain, infection or trauma.[25]

However, for both the regulatory bodies and the health institutions, conduct in the dental office should be based on the autonomy of the dental surgeon who will be providing the care. The recommendation for care during the COVID-19 pandemic was that professionals should act according to the specificity of each case.[25]

Thus, although procedures such as ART, restorations, prophylaxis and scraping are not considered urgent as a priority and can be postponed and scheduled, the clinic has sovereignty.[27] In other words, even with recommendations that these appointments be postponed during critical events such as the COVID-19 pandemic, the dental surgeon is the one who decides whether the appointment is an emergency or not. And, therefore, when the procedure should be carried out.

This decision about what is urgent or elective is part of the assessed need and represents the professional's power over users and health systems. And, according to Andersen, while medical services represent a response to health problems and conditions, explained by need and demographics, dental services are explained by social structure.[17]. This has also been pointed out by more recent studies on the social determinants of health and oral health, especially in the context of the COVID-19 pandemic, which has left marginalized groups even more vulnerable to oral diseases.[28,29]

Thus, the balance of the most performed procedures, whether urgent or non-urgent, shows that, according to Levesque, Harrys and Russel, there are problems with access to oral health care in the municipality, since users were not attended to at the time they needed to stop the progression of the disease.[30] This is demonstrated by the fact that the most frequent procedures are necessary when the caries disease, even if chronic and slow, has progressed to the point where more invasive procedures such as endodontic treatments and even mutilating ones such as extractions are necessary.

Another important factor that the data shows is that the municipality has also suffered secondary impacts from COVID-19, since this type of impact is linked to access to health care, which has been impaired and is evident in the decrease in the number of procedures carried out in the years 2020 and 2021. This is in line with other studies carried out in the country.[18,23,27]

CONCLUSION

The data analyzed corroborates the perception that the restrictions imposed on dental care offered by the unified health system have had a negative impact on health services in the municipality of Jaboatão dos Guararapes (PE). However, they do not allow us to verify whether access is efficient or even effective, because there is no way of measuring user satisfaction or health status through them alone. It is therefore important to note which procedures have been carried out the most so that public policies can intervene in the disease at the moment the user needs it to prevent the progression of diseases such as caries, which can lead to tooth loss. There are also problems with the population's access to oral health services, since there are few dental appointments, indicating that there are problems with attracting new users. It is therefore necessary for public policymakers to consider dentistry as a priority sector. It is also recommended to investigate the impact of the reduction in the supply of dental procedures on the health of users and to carry out actions aimed at preventing and remedying the problems caused to the oral health of the population. Especially the poorest, who are dependent on public health for health care, especially dental care. This study has limitations. Not all databases were included, and only procedures carried out in primary care were analyzed. It is therefore recommended that further research be carried out into the secondary impacts of COVID-19 on oral health. However, it should be emphasized that the results obtained in this study demonstrate the need to increase access to dental treatment.

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