

Integrity, absenteeism and resolubility of specialized care for pediatric patients: a cross-sectional study

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Abstract: Dental Specialties Centers (CEOs) are clinics representing part of the secondary oral health care system of the Brazilian Unified Health System (SUS). Pediatric dentistry is not a requirement for service accreditation. However, the CEO of the Federal University of Rio Grande do Sul (CEO-UFRGS) has provided dental care for children aged 3–11 years since 2017. The utilization rates of health services are influenced by absenteeism. Therefore, evaluation of absences for dental appointments is of primary importance. This study aimed to evaluate referral characteristics, absenteeism, and resolubility of pediatric dentistry appointments at the CEO-UFRGS. This retrospective cross-sectional study was conducted at the Dental Teaching Hospital of the university and analyzed secondary data from referrals and medical records. From August 2017 to December 2019, 167 referrals and 96 medical records were reviewed, from which data of individual variables related to the referral process and treatment were collected. Data were collected by a single trained examiner and analyzed using SPSS software. The main reasons for referral to secondary care were dental caries and pulpal or periapical diseases associated with difficult-to-manage behavior. An absenteeism rate of 28.1% at the first pediatric dental visit and a resolution rate of 65.6% were found. Binary logistic regression analysis indicated that each day of waiting for specialized care resulted in a 0.3% of higher chance of absence for appointment. This also increased the chance by 0.7% in child who attended the first visit to complete treatment, suggesting that the waiting time for attendance was associated with absenteeism and resolubility. Public policies that expand providing child dental care in secondary care are recommended to improve access to and resolubility of services.

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Introduction

Background

The Brazilian Unified Health System (SUS) offers universal access to health services. This is based on integral care, defined as a coordinated and continuous set of preventive and curative actions and services, both individual and collective, required for each case at all levels of complexity

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of the system.¹ Dental care services are guided by the National Oral Health Policy, which aims to expand and qualify oral health care in primary, secondary, and tertiary care services.²

One of the bases of the National Oral Health Policy for the expansion of secondary care services is the incentive to operate Dental Specialties Centers (CEOs).² The CEOs were established with the goal of achieving integrity in oral health care as a reference to primary care units for performing more complex treatments. These services are registered in the National Registry of Health Establishments as Specialty Ambulatory Clinic/Specialized Clinics. For a CEO to be registered, the service must offer at least five mandatory specialties. These comprise oral diagnosis with emphasis on oral cancer detection, specialized periodontics, endodontics, minor oral surgery, and care for people with special needs. Public health units and universities of any kind could qualify as CEO.³

Pediatric dentistry is not included in the list of specialties required for the accreditation of CEOs. However, this specialty is strategically essential for public health services due to still consequences of caries in Brazilian children. Essvein et al.⁴ observed that almost one-fifth of primary care oral health teams did not provide care for children under 5 years of age. Vicente et al.⁵ stated that there was a need for including the specialty of pediatric dentistry in the CEOs, which is necessary to reduce the prevalence of caries in childhood. Additionally, epidemiological studies indicated that Brazil has not yet reached the WHO goal for the year 2000 regarding children at age of 5, in which 50% of them would be free of caries. Although the above-mentioned literature set the age of 5 as a reference, it is important to consider the difficulty in accessing dental care in early childhood that is associated with the cumulative nature of caries disease. Therefore, it is expected that school-age population (children aged 6–12 years) will present with complex dental conditions that may require intervention by a pediatric dentistry specialist.

There is a CEO at the Federal University of Rio Grande do Sul (CEO-UFRGS) that cares for patients from the city of Porto Alegre. However, in

the CEO, absenteeism at the first appointment was an observed problem. These patient absences result in loss of treatment continuity; higher chance of disease progression; waste of material and human resources; increase in waiting lists for vacancies;^{6,7} and in university's CEO, impairment of educational processes for undergraduate preparation. There is a need for expanding the use of public oral health services by children^{8–12} in which the utilization rates of health services have been known to be negatively affected by absenteeism.¹³ Therefore, evaluation of absenteeism from pediatric dentistry appointments is of primary importance.

The null hypothesis of this study was that individual and social variables, scheduling characteristics, oral diagnosis, and treatment needs were not related to absenteeism from first specialist pediatric dentistry appointments and treatment conclusions.

Objectives

Thus, this study aimed to evaluate the characteristics of referral and absenteeism in children aged 3–11 years from their first dental appointment in the Pediatric Dentistry Specialty in the CEO of UFRGS. This study also aimed to assess the resolubility of the service, based on dropout rates and treatment conclusions.

Methodology

Study design

This retrospective cross-sectional study was conducted at the Dental Teaching Hospital of the School of Dentistry, UFRGS, including secondary data from electronic referrals and medical records.

Setting

This study was conducted at the CEO of the Federal University of Rio Grande do Sul (CEO-UFRGS), which receives patients from the city of Porto Alegre through a referral and counter-referral system for primary care. The pediatric patients were examined by final-year undergraduate students enrolled in the Obligatory Curricular Internship. The process was under supervision of UFRGS-affiliated dental surgeons and professors, in a clear interrelationship between teaching and service. The CEO-UFRGS has

been providing mandatory specialties for registration since 2006. Additionally, since 2017, it has offered the specialty of pediatric dentistry, even though this is not mandatory for service accreditation. At the CEO-UFRGS, the Baby Clinic cares for children between 0 and 3 years of age and provides pediatric dentistry for those between 3 and 11 years of age.

Participants

The inclusion criteria comprised referrals and dental records of patients aged 3–11 years referred by the oral health teams of primary health care in Porto Alegre to the specialty of pediatric dentistry at the CEO-UFRGS from August 2017 to December 2019. Patients with available information on attendance at the first appointment and treatment conclusion were enrolled in the study. The exclusion criterion was duplicate records from the same individual.

Variables

From the electronic referrals, the independent variables “sex”, “age in years at the time of referral”, “reason for referral expressed by International Classification of Diseases 10th Revision [ICD-10]”, “child’s behavior”, and “shift of the specialist appointment” were retrieved. Data of “distance (kilometers) between the health unit that originated referral and CEO”, “waiting time for appointments (days)”, “previousness (days) at which the family was notified about appointment”, and outcomes of “attendance or absence” were collected. The independent variables “age (years) at the first specialist appointment”, “race/color”, “usual companion at appointments”, and “caries experience assessed by decayed-missing-filled teeth (dmft)” were obtained. Moreover, Data of “number of appointments until conclusion or abandonment of treatment”, “number of absences until conclusion or abandonment of treatment”, and outcomes of “treatment conclusion or abandonment” were collected from the medical records.

Data sources and study size

The study recruited a convenience sample of 177 referrals to the specialty of pediatric dentistry at the CEO-UFRGS by the Consultation Regulation Center

of Porto Alegre between August 2017 and December 2019. In addition, 96 records of patients who attended the first consultation were also included in the analysis.

To avoid bias, data were collected by a single trained researcher using spreadsheets prepared in Excel and analyzed using SPSS version 23 software.

Statistical methods

Frequency tables were used to describe categorical variables. Quantitative variables were presented as means and standard deviations. Since the data did not present a normal distribution, the association between categorical variables was analyzed using the chi-square test and quantitative variables using the Mann-Whitney test. Bivariate logistic regression was used to estimate the chances of absenteeism and treatment conclusions according to independent variables. Analysis of deviance was used to assess the statistical significance of the odds ratio using the Wald test. Multiple referrals for the same user and referrals or records with missing data were excluded from data analysis.

Ethical aspects

This study was approved by the Research Ethics Committee of the Federal University of Rio Grande do Sul (CAAE 21165019.9.0000.5347) and Research Ethics Committee of the Health Department of the City of Porto Alegre (CAAE 21165019.9.3001.5338).

Results

Absenteeism from first appointment

A total of 177 electronic referral records were extracted between August 2017 and December 2019. Five patients were referred twice. Thus, 10 referrals were excluded from all analyses because they violated the assumption of independence of observations. All 167 records provided data on “sex”, “age at time of referral”, “ICD-10”, “shift of specialist appointment”, “waiting time for appointment (days)”, and “attendance or absence at first specialist appointment”. Of these, 162 provided data on which health care unit requested referral. Furthermore, 146 records provided data on how long the family received notice of appointment scheduling (Figure).

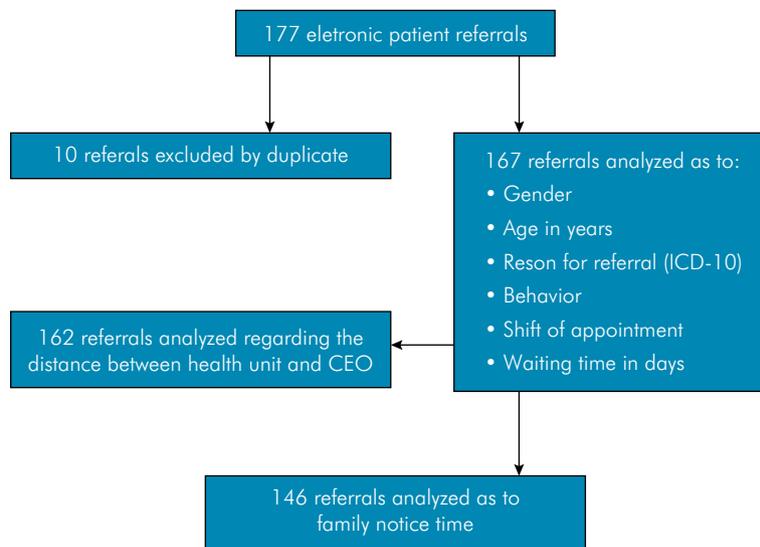


Figure. Flowchart of the distribution of the sample of electronic referrals and medical records.

The percentage of absenteeism from the first pediatric dentistry appointment was 28.1%. The mean age of the referred patients was 5.11 years (standard deviation [SD], 1.97). The main reasons for referral according to the ICD-10 were pulp/periapical disease and dental caries. In 55.7% of the cases, the children had difficult-to-manage behavior, as described in the referral. Age, sex, reason for referral, child behavior, and distance between the health unit and CEO were not statistically associated with absenteeism from the first specialist consultation. The characteristics of the samples regarding the collected variables are listed in Table 1.

The mean waiting time between the request for the specialist appointment and its performance was 142.2 (SD, 113.8) days. Additionally, this variable was statistically associated with missed visits ($p = 0.017$). Regarding the shift of appointment, there was a greater trend of absenteeism in the afternoon ($p = 0.04$) (Table 1).

Table 2 presents the data from the binary logistic regression analysis of the association between absenteeism at the first appointment and waiting time (days) for scheduling. An odds ratio value of 1.003 (95% confidence interval [CI]: 1.000–1.006) was obtained, showing that each additional day waiting for specialized care resulted in a 0.3%

greater chance that the child would not attend the appointment. Regarding the association between shift and absenteeism, an odds ratio of 2.153 (95%CI: 1.027–4.515) was obtained, with a higher chance of absenteeism in the afternoon (Table 2).

Treatment abandonment

To evaluate the service’s resolubility, 96 medical records of the children seen at the CEO-UFRGS were reviewed. The resolution rate was defined as the ratio of the total number of completed treatments to the total number of users who attended their first appointments and had their medical records evaluated. The treatment conclusion was verified by mentioning the patient’s discharge in the medical record or by describing the conclusion of planned invasive procedures and at least one health counseling visit. The power of the study was evaluated on the openepi.com website by comparing the means between the groups, and values greater than 80% were extracted.

A 65.6% resolution rate was observed: of the 96 records evaluated, 63 reported treatment completion. Table 3 shows the characterization of the samples evaluated with regard to the conclusion of treatment.

Sex, race, child’s behavior, usual companion at appointments, age at first appointment, and

Table 1. Characterization of the sample and association between absenteeism from first appointment, gender, ICD-10, child's behavior, shift of appointment, age in years, distance between the health unit and CEO, waiting time (days) and notice (days).

Variables	Attendance at first appointment			p-value
	Yes (n = 120)	No (n = 47)	Total (n = 167)	
	n (%)	n (%)	n (%)	
Gender				
Male	60 (50)	29 (61.7)	89 (53.3)	0.173 ^a
Female	60 (50)	18 (38.3)	78 (46.7)	
ICD-10				
K02 (dental caries)	49 (40.8)	18 (38.3)	67 (40.1)	
K04 (pulp/periapical disease)	64 (53.3)	27 (57.4)	91 (54.5)	0.854 ^a
Other	7 (5.8)	2 (4.3)	9 (5.4)	
Behavior				
Positive	55 (45.8)	19 (40.4)	74 (44.3)	0.527 ^a
Difficult-to-manage	65 (54.2)	28 (59.6)	93 (55.7)	
Shift				
Morning	95 (79.2)	30 (63.8)	125 (74.9)	0.040 ^a
Afternoon	25 (20.8)	17 (36.2)	42 (25.1)	
	Mean (SD)	Mean (SD)	Median / Mean (SD)	
Age in years	5 (2)	5.2 (1.7)	5 / 5.1 (1.97)	0.429 ^b
Waiting time in days	129.9 (108.6)	173.5 (121.8)	105 / 142.2 (113.8)	0.017 ^b
Attendance at first appointment	Yes (n = 116)	No (n = 46)	Total (n = 162)	
	Mean (SD)	Mean (SD)	Median / Mean (SD)	
Distance Between health unit and CEO	11.6 (5)	11.7 (5.7)	11,8 / 11.7 (5.2)	0.861 ^b
Attendance at first appointment	Yes (n = 99)	No (n = 47)	Total (n = 146)	
	Mean (SD)	Mean (SD)	Median / Mean (SD)	
Notice period in days	7.7 (4.1)	8.1 (4.5)	6,5 / 7.8 (4.3)	0.524 ^b

a: chi-square; b: Mann Whitney test.

Table 2. Bivariate logistic regression analysis of association between absenteeism from first consultation and the variables "waiting time in days" and "appointment shift".

Variables	OR	Confidence interval 95%		p-value
		Lower	Upper	
Waiting time in days	1.003	1.000	1.006	0.029
Appointment shift	2.153	1.027	4.515	0.042

distance between the health unit of origin and CEO showed no association with treatment conclusion. The patients who did not complete treatment had a higher mean dmft than those who completed treatment. However, this difference was not statistically significant. The mean number of missed return appointments among users who

did not complete treatment was higher, whereas the number of scheduled returns was higher in the group that completed treatment, with statistically significant differences (Table 3).

Waiting time (days) showed a statistically significant association with the outcome of "treatment conclusion," with a higher rate of treatment

Table 3. Characterization of the sample and association between treatment conclusion, gender, race, child behavior, caregiver, age in years, dmft, distance between the health unit and CEO, waiting time in days, number of appointments, and number of absences.

Variable	Treatment conclusion			p-value
	Yes (n=63)	No (n=33)	Total (n=96)	
	n (%)	n (%)	n (%)	
Gender				
Male	33 (52.4)	14 (42.4)	47 (49)	0.354 ^a
Female	30 (47.6)	19 (57.6)	49 (51)	
Race				
Caucasian	33 (52.4)	14 (42.4)	47 (49)	0.392 ^a
Dark-Skinned	10 (15.9)	9 (27.3)	19 (19.8)	
No information	20 (31.7)	10 (30.3)	30 (31.3)	
Behavior				
Positive	25 (39.7)	15 (45.5)	40 (41.7)	0.586 ^a
Difficult-to-manage	38 (60.3)	18 (54.5)	56 (58.3)	
Caregiver				
Parents	51 (81)	26 (78.8)	77 (80.2)	0.800 ^a
Other	12 (19)	7 (21.2)	19 (19.8)	
	Mean (SD)	Mean (SD)	Median / Mean (SD)	
Age in the first appointment	5.6 (1.2)	5 (2)	5 / 5.4 (2)	0.156 ^b
DMFT	7 (3.6)	8.1 (3.1)	7 / 7.4 (3.4)	0.063 ^b
Distance between health unit and CEO	11.1 (4.5)	11.5 (4.9)	11,4 / 11.2 (4.6)	0.755 ^b
Waiting time in days	154.6 (119.1)	100.8 (38.1)	105 / 136.1 (102)	0.036 ^b
Number of appointments	8.2 (3.9)	6.2 (3.6)	7 / 7.5 (4)	0.015 ^b
Number of absences	0.6 (0.9)	2 (1.25)	1 / 1.2 (1.2)	0.000 ^b

a: chi-square; b: Mann Whitney test.

Table 4. Bivariate logistic regression analysis of association between treatment conclusion and waiting time (days).

Variable	p-value	OR	Confidence interval 95%	
			Lower	Upper
Waiting time in days	0.022	1.007	1.001	1.014

completion among users who waited longer for the first specialist consultation ($p = 0.036$) (Table 3). The relationship between waiting time for the first specialist appointment and treatment conclusion was evaluated using binary logistic regression. Each additional day of waiting for an appointment at the

CEO was found to increase the chance of the child completing treatment by 0.7% (Table 4).

Discussion

The literature presents data from different countries associating individual, service, and socioeconomic characteristics with absenteeism from pediatric dentistry appointments.^{6,7,14,15}

A similar study conducted in the city of Curitiba, Brazil, observed an absenteeism rate of 28.3% from first pediatric dental appointments in the municipality's CEOs. Moreover, the study found an association between district family income and waiting time

for appointments and absenteeism. Children living in places where family income was less than two minimum wages were 2.33 times more likely to miss their first appointment. Moreover, each additional day of waiting for an appointment increased the chance of non-attendance by 0.1%.⁶ The data from this study confirmed the findings of the present study because we observed a similar percentage of absences for the first appointment (28.1%) and association between waiting time and absenteeism. Thus, each additional day of waiting for the appointment increased the chance of absence by 0.3%.

Regarding the shift of appointments, this study found a greater trend of absenteeism in the afternoon. However, the difference in sample size between the groups, due to the large number of appointments in the morning, made it difficult to analyze this variable (Table 1). Binary logistic regression analysis suggested a higher chance of missing afternoon appointments, with an odds ratio of 2.153 (95% CI: 1.027–4.515). However, the wide CI obtained may indicate that this association was unreliable (Table 2).

Bathia et al.¹⁵ performed a study in India in which they evaluated absenteeism of children from dental appointments. The authors found no association between age, sex, socioeconomic status, and absenteeism. However, this study found a significant association between remembering from memory the appointment dates and missing them compared with other ways of remembering appointment dates, such as writing in a diary or taking a message on the phone. In the present study, individual and family characteristics were not assessed through questionnaires. However, this approach is important in future Brazilian studies to elucidate other variables associated with absenteeism regarding pediatric dentistry appointments.

A study conducted by West et al.⁷ in the United Kingdom assessed absenteeism from primary health care dental appointments for users of various age groups. They revealed an association between absenteeism and both age and sex. They found that male patients and those under the age of 18 were more likely to miss appointments. The regression model in this study showed that in patients being younger by every year, there was a 1% higher chance

of missing an appointment. The results of this British study highlighted the importance of studying the causes of absenteeism from dental appointments in children and adolescents as these users were found to more likely miss appointments.

The study by Gustafsson et al.,¹⁴ performed in Sweden, evaluated the factors related to the discontinuation of specialized dental treatment in children and adolescents. They indicated that patients with greater caries experience, lower socioeconomic status, and children of separated parents were more likely to discontinue treatment. Our study observed no statistically significant difference in caries experience between children who completed treatment and those who defaulted. However, similar to the study by Gustafsson et al.¹⁴ (2010), the patients who did not complete treatment had a higher dmft index.

Similar to the present study, Fonseca et al.¹⁶ showed no association between absenteeism and sex, age, and distance from the specialized service. However, they found that changing professionals increased the chance of missing appointments by almost 2 times. This is an important result showing the professional-patient tie, in which changes in professionals can demotivate patients from continuing their treatment. At CEO-UFRGS, the patients were examined by final-semester undergraduate students under the supervision of a professional specialist in the area. Therefore, our study did not assess the association between professional-patient relationships and absences because the change in trainees can be inherent to the context of a university CEO. Regarding the absence of an association between distance to the specialized service and treatment conclusion, our study did not evaluate the means of transportation used by users to reach the service. Of note, this is a variable that could be associated with absenteeism.

The resolvability rate observed in the sample of the present study was 65.6%. Saliba et al.¹⁷ observed a similar resolvability (62.67%) when evaluating treatment completion in the specialties of minor oral surgery, endodontics, and periodontics at a CEO in the State of São Paulo, Brazil. The authors found dropout percentages of 30.42% for endodontics and 57.93% for

periodontics. In addition, they reported that the need for several appointments for treatment conclusion may have been associated with treatment evasion. Regarding pediatric dentistry, since behavioral adjustment sessions are required, it is also usual to schedule several appointments for treatment completion. In addition, several appointments were scheduled for surgical and/or rehabilitative procedures, given the high caries experience presented by patients managed in secondary care.

This study observed a higher mean number of missed return appointments among the patients who discontinued treatment ($p < 0.001$). However, the number of scheduled returns was higher in the group that completed treatment ($p = 0.015$) (Table 3). These results were expected because the service adopts the strategy for disconnecting the patient after three consecutive absences over an academic semester.

In 34.4% of children who did not complete treatment, the mean number of appointments was 6.2 (SD, 3.6). Due to the complexity of the oral health situation of the children treated at the CEO-UFRGS, several appointments were required for implementing treatment plans. Regarding these data, it is important to mention the concepts of felt and observed needs,¹⁸ highlighting that the need felt by families is not always compatible with that observed by professionals. It is possible that some families might have not taken their children to the appointments after treatment of their perceived conditions, discontinuing treatment before undergoing all sessions planned by the professionals.

Since each additional day on the waiting list increased the chance that child who attended the first appointment would complete treatment by 0.7 %, this study observed that the waiting time for scheduling the first appointment could influence the resolutibility of the service. The relationship between waiting time for dental treatment and treatment conclusion has not yet been explored in the literature. However, it could be suggested that difficulty in obtaining a vacancy may have motivated families not to miss appointments. However, considering, the concept of felt need¹⁸, prompt access to specialized treatment is essential, because it allows for resolution of the patient's problem, even if treatment was

not completed from the technical-scientific point of view. The percentages of 28.3% of absenteeism from the first visit and 34.4% of abandonment of specialized treatment in pediatric dentistry have been shown to be moderate. However, these percentages would become significant when placed in the epidemiological context of difficult access to dental treatment in children managed both in primary and specialized care.^{4,8-12} Therefore, it might be evident that strategies should be adopted to make better use of the available services.

This study has several limitations. These included the use of secondary data; no evaluation through a questionnaire of individual and family variables that may be related to absenteeism; and loss of some data due to inadequate filling of referrals and medical records. In addition, the fact of providing dental service by a university specialized center-based study, which may have not reflected the reality of other services, would be considered a limitation. However, this study highlighted important information for the management of secondary care services in oral health.

Public policies to improve the access to and resolution of child dental care in the SUS are necessary. Training for primary care professionals to perform dental procedures in children could increase their resolutibility and reduce the queues for attendance at secondary care. In addition, as already has been recommended by Vicente et al.,⁵ the presence of a pediatric dentist in a specialized center is important for managing cases of high technical complexity. The results of this study might suggest that it is important to have an adequate number of specialists in those centers to reduce the number of days waiting for care and, consequently, absenteeism.

Conclusions

This study concluded that 28.1% of the patients referred to pediatric dentistry at the CEO-UFRGS missed their first appointments. Evaluating the profile of patients showed that referral usually occurred due to the presence of carious lesions and/or endodontic impairment, in most cases associated with difficult-to-manage behaviors. The waiting

time for scheduling a specialized appointment was high and associated with absenteeism from the first visit. The percentage of resolubility of the service was 65.6%, indicating that most patients who attended their first visit completed treatment. Public policies that expand both the number of pediatric dentists and provide dental treatments for children in secondary care are recommended. These policies

are essential for improving access and resoluteness of services, as a high waiting time could be a barrier to accessing services, contributing to absenteeism.

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