Caregivers' Perceptions Regarding Oral Health Status of Children and Adolescents with Cerebral Palsy

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Objectives: *The aim of the present study was to compare the perception of caregivers regarding the oral health status of children and adolescents with cerebral palsy (CP) and those with typical development.* ***Study Design:*** *Study group (SG) was composed of 35 children and adolescents with a clinical diagnosis of CP and their caregivers. Control group (CG) was composed of 35 individuals with typical development (matched with the SG for age, sex and caries activity) and their caregivers. Questionnaire was administered to caregivers addressing the oral health of individuals under their care. Caries activity, dmft/DMFT index, visible plaque index (VPI) and occlusal characteristics were determined.* ***Results:*** *Statistically significant differences were found in the perceptions of dental problems ($p = 0.004$) and gingival bleeding ($p = 0.013$). Individuals in SG whose caregivers perceived dental problems had a higher mean VPI (50.84 ± 5.11%) than those in CG (27.97 ± 6.50%). The mean dmft/DMFT in the SG was 2.77 ± 3.20. Class II molar relationship, overjet and anterior open bite were more prevalent in the SG.* ***Conclusion:*** *Caregivers of children/adolescents with CP perceive more oral problems, such as visible plaque, gingival bleeding and malocclusion, than caregivers of children/adolescents with typical development.*

Keywords: *perception; oral health; cerebral palsy.*

INTRODUCTION

Cerebral palsy (CP) stems from static damage of the central nervous system during fetal development or infancy. CP is defined as a non-progressive movement and posture disorder with a variable incidence, affecting 1.5 to 5.0/1000 live births[1-3].

Oral diseases constitute an important health problem among individuals with CP. Children and adolescents with special needs are at greater risk of oral problems. The inherent neuromuscular disorders of CP can exert a significant negative impact on oral health in different ways, including structural changes in the orofacial region, the development of parafunctional habits, difficulty maintaining adequate oral hygiene and problems related to eating as well as barriers related to access to dental care[4-6].

Due to physical problems and spasticity, individuals with CP are dependent on their caregivers for both general care and oral hygiene[7-10]. Regular daily care provided by a caregiver is important to the prevention of oral problems[11]. CP is a neurological problem that is often not well understood on the part of family members and caregivers, which underscores the need for health professionals to offer more information on this disease. However, caregivers consider themselves to be competent with regard to daily responsibilities and taking on a proactive role in the rehabilitation process[12].

In some studies, caregivers of children and adolescents with CP expressed greater discomfort regarding the effects of oral

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problems on the lives of these individuals and demonstrated greater concern for oral health than caregivers of children and adolescents with typical development[5,13]. However, other studies found that caregivers' perceptions regarding the oral health of individuals with CP did not correspond to the actual condition determined by the dentist[14,15].

Despite societal advances in the development of social inclusion policies, this continues to be an overlooked population from the standpoint of oral health. The study of oral problems in individuals with disabilities has become increasingly important in recent decades due to the greater value given on the part of concerned groups to diminishing the differences and inequalities to which this population is subjected. Considering the current demands for dental care on the part of these patients, it is important to have knowledge on the oral health conditions that affect them to enable the drafting of inclusion strategies. Indeed, humanized inclusion programs should be created to raise awareness regarding the importance of early oral health care to the maintenance of general health among individuals with CP[11,16-18].

Therefore, the aim of the present study was to describe and compare the perceptions of caregivers regarding the oral health status of children and adolescents with CP and those with typical development.

METHOD

An observational cross-sectional study was conducted between March and September 2017 following approval from the Human Research Ethics Committee of the Franciscan University in the city of Santa Maria, Brazil (certificate of approval: 2.066.988, certificate of presentation: 68025517.3.0000.5306).

Study population

The study group (SG) was composed of 35 male and female children and adolescents aged two to 20 years with a clinical diagnosis of CP and their caregivers. The control group (CG) was composed of 35 systemically healthy individuals with typical development [matched with the SG for age (± one year), sex and caries activity (determination of at least one tooth with active caries)]. The patients in the SG were recruited from reference centers in the city of Santa Maria: Parents and Friends Association of Children with Special Needs, Physical Therapy Practical Teaching Lab of the Franciscan University and the Antônio Francisco Lisboa School. The participants in the CG were recruited from the Dental Practices Lab of the university. The caregivers were asked to bring the patients to the Dental Practices Lab for the oral examinations. Prior to the administration of the questionnaire and clinical examinations, the caregivers received detailed clarifications regarding the objectives and procedures of the study and agreed to participate by signing a statement of informed consent. Children and adolescents whose caregivers declined to participate and those who did not cooperate during the examinations were excluded from the study.

Data collection

Data collection involved the administration of a questionnaire with open-ended and closed-ended questions to the caregivers addressing the oral health of the children and adolescents under their care. The questionnaire was answered in a reserved room in the presence of a researcher who had undergone training for this purpose while a dentist performed the oral examination of the child or adolescent. The questions addressed oral problems perceived by the caregivers and the difficulties they encountered regarding the oral health of the child or adolescent[19].

The evaluation of the oral health status of the children and adolescents in both groups was performed by a single dentist who had undergone training and calibration exercises. For such, the participant was seated in a dental chair under the light of the reflector and the examination was performed with the aid of a number 5 mouth mirror and exploratory probe.

The recommendations of the World Health Organization (WHO) were used for the determination of dental caries (present or absent), caries activity (active or caries free) and the dmft/DMFT index. The WHO also established a dmft/DMFT severity scale: 0 to 2.6 = very low to low; 2.7 to 4.4 = moderate; > 4.5 = high to very high[20].

The visible plaque index (VPI) was determined after drying the tooth surfaces. The presence/absence of visible plaque was determined without any mechanical or chemical means[21].

Malocclusion was investigated with the patient performing maximum intercuspation and evaluated using the malocclusion index[22] and Angle classification[23]. The occlusal characteristics considered were midline, molar relationship, overbite, overjet, anterior crossbite, posterior crossbite, anterior open bite and posterior open bite. Based on the findings, the presence/absence of malocclusion was recorded.

Statistical analysis

The data were analyzed quantitatively using the SPSS program, version 20, and considering a 5% significance level ($p < 0.05$). The Kolmogorov-Smirnov test was used to determine the normality of the data. The *t*-test for independent variables was employed to compare mean ages. The Mann-Whitney test was used to compare mean dmft/DMFT indices. The chi-square test was used to determine associations among the variables in the two groups. The Kruskal-Wallis and Mann-Whitney tests were used to analyze the association between the perception of oral problems and the VPI.

RESULTS

Forty children and adolescents with CP from the three major reference centers in the city of Santa Maria were eligible for the study. However, the caregivers of three declined to participate and the clinical examination was not possible in one child and one adolescent. Thus, the sample totaled 35 participants (response rate: 87.5%).

Table 1 displays the general characteristics of the study population. In both groups, 80% (n = 28) of the primary caregivers were mothers.

Table 2 displays the oral health findings of the children and adolescents in the two groups and the perceptions of their caregivers. No significant difference was found in the classification of oral health on the part of the caregivers ($p = 0.051$). However, statistically significant differences were found in the perception of dental problems ($p = 0.004$) and gingival bleeding ($p = 0.013$).

The analysis of the dentition revealed that a Class II molar relationship, overjet and anterior open bite were significantly more prevalent among the individuals in the SG compared those in the

CG (Table 3). The mean dmft/DMFT index in the SG was 2.77 ± 3.20 and the majority of children and adolescents in this group (57.1%) had very low to low caries severity, which was similar to the finding in the CG (Table 3).

Table 4 displays the association between the perception of oral problems on the part of the caregivers and caries activity, malocclusion, visits to the dentist and VPI. The majority of caregivers in the SG (n = 14) reported perceiving some problem in the teeth of the children and adolescents under their care, even those not exhibiting active caries (n = 20). This difference in comparison to the caregivers in the CG was statistically significant ($p = 0.009$). Only one caregiver in the CG reported perceiving a problem in the teeth of the care recipient and this individual did not have the habit of visiting a dentist. In the SG, 14 children and adolescents did not have the habit of going to the dentist. An association was found between the habit of visiting a dentist and the perception of dental problems in both groups ($p = 0.002$). An association was also found between the perception of dental problems and the VPI ($p = 0.011$). Children and adolescents in the SG whose caregivers perceived problems with their teeth (n = 25) had a higher mean VPI (50.84 ± 5.11%) than those in the CG (27.97 ± 6.50%).

DISCUSSION

The present study evaluated the perceptions of primary caregivers regarding the oral health of children and adolescents with CP (SG) in comparison to those with typical development (CG). Caregivers make important contributions to the rehabilitation process of individuals with CP and are the ones who receive guidance from health professionals regarding the actions to be adopted in day-to-day living. Considering the increasing recognition that oral health is a basis for general wellbeing, regular daily care on the part of caregivers is important to the prevention of oral diseases[8,9,11,24].

The mean dmft/DMFT index in the SG was 2.77 ± 3.20 and the majority of children and adolescents in this group (57.1%) had very low to low caries severity. These findings are in agreement with data described in previous studies[4,14,25,26].

The vast majority (80%) of caregivers were the mothers of the children and adolescents. Mothers are often given the responsibility for the health of children and adolescents and feel entrusted to take on a more active role in the lives of their children[12,15,18,27,28].

Regarding the caregivers' classifications of oral health, only 14.3% in the SG and 34.3% in the CG considered the oral health of their children and adolescents to be excellent or very good. The majority of caregivers in the SG (85.7%) classified their child's/adolescent's oral health as fair or poor. Similar results have been reported in previous studies, in which 42% of caregivers assessed the oral health of the individuals with CP under their care as fair or poor[4,25]. In other studies, 70% of caregivers describe the oral health status of individuals with special needs as good, but stress the need for control and prevention measures with a focus on health promotion[14,29]. Indeed, the development of oral health promotion programs directed at caregivers of individuals with special needs is important. Educational actions help caregivers develop a critical awareness of the actual causes of oral problems and the autonomy to change habits, leading to improvements in the oral health status of individuals with CP[30].

The oral hygiene habits of children and adolescents with CP are considered precarious. Brushing frequency and technique are inadequate. The maintenance of proper oral hygiene is complicated by factors such as dyskinetic movements, orofacial reflexes (biting and gagging) and the inability to handle the brush properly. Therefore, individuals with CP, even those with no intellectual impairment, depend on another person to assist in activities of daily living, since hygiene requires coordinated muscle movements and motor strength[6,10,30]. As a consequence, caregivers of children with CP assist more during tooth brushing than caregivers of children with typical development[31]. Indeed, oral hygiene was performed by the mother or other caregiver in 79.4% of the cases in the SG in the present study, whereas the child/adolescent himself/herself performed oral hygiene in 77.1% of the cases in the CG. Assisting children with tooth brushing is a practice that is highly recommended for children in general and especially those with CP, as they do not have the dexterity to perform the task properly[31].

TABLE 1. General characteristics of participants in study and control groups.

Variable	SG (n=35)	CG (n=35)
Age (mean±SD)	10.03±5.32	10.11±5.40
Sex n(%)		
Male	23(65.7%)	23(65.7%)
Female	12(34.3%)	12(34.3%)
Type of Dentition n(%)		
Primary	8(22.9%)	9(25.7%)
Mixed	13(37.1%)	14(40.0%)
Permanent	14(40.0%)	12(34.3%)
Caries Activity n(%)		
Active caries	16(45.7%)	16(45.7%)
Caries free	19(54.3%)	19(54.3%)
Caregiver n(%)		
Mother	28(80.0%)	28(80.0%)
Father/Grandparent/Nanny	7(20.0%)	7(20.0%)
Mother's Schooling n(%)		
Incomplete elementary school	10(28.6%)	11(31.4%)
Complete elementary school	7(20.0%)	5(14.3%)
Complete high school	15(42.8%)	16(45.7%)
Complete university	3(8.6%)	3(8.6%)
Family Income n(%)		
Brazilian monthly minimum wage	13(37.1%)	9(25.7%)
2 x monthly minimum wage	17(48.6%)	18(51.4%)
3+ x monthly minimum wage	5(14.3%)	8(22.9%)
Motor Impairment n(%)		
Diplegia	5(14.3%)	—
Hemiplegia	7(20.0%)	—
Quadriplegia	23(65.7%)	—
Muscle tone n(%)		
Spastic	31(88.5%)	—
Ataxic	1(2.9%)	—
Mixed	3(8.6%)	—

TABLE 2. Quality of oral health of children and adolescents and caregivers' perceptions.

Questions	SG (n=35) n(%)	CG (n=35) n(%)	*p*-value*
How would you classify the oral health of the child/adolescent under your care?			
Excellent/Very good	5(14.3%)	12(34.3%)	*p*=0.051
Fair/Poor	30(85.7%)	23(65.7%)	
Do you perceive any problems in his/her teeth?			
Yes	25(71.4%)	13(37.1%)	*p*=0.004**
No	10(28.6%)	22(62.9%)	
Do you perceive if his/her gums bleed?			
Yes	18(51.4%)	8 (22.9%)	*p*=0.013**
No	17(48.6%)	27 (77.1%)	
Is there any oral hygiene method used with the child/adolescent?			
Yes	34(97.1%)	35(100%)	*p*=0.314
No	1(2.9%)	0(0%)	
What oral hygiene method is used?			
Brush+paste	29(85.5%)	20(57.1%)	*p*=0.003**
Brush+paste+dental floss	3(8.6%)	15(42.9%)	
Gauze	2(5.7%)	0(0%)	
Who is responsible for the oral hygiene of the child/adolescent?			
Mother	19(55.9%)	7(20.0%)	*p*<0.001**
Father/Grandparent	8(23.5%)	1(2.9%)	
Child/Adolescent	7(20.6%)	27(77.1%)	
Is there any difficulty in performing oral hygiene in the child/adolescent?			
Yes	24(68.6%)	3(8.6%)	*p*<0.001**
No	11(31.4%)	32(91.4%)	
Is the child/adolescent customarily taken to the dentist?			
Yes	16(45.7%)	26(74.3%)	*p*=0.015**
No	19(54.3%)	9(25.7%)	
How often?			
Only once	20(57.1%)	11(31.4%)	*p*=0.032**
Once a year	5(14.3%)	14(40.0%)	
More than once a year	10(28.6%)	10(28.6%)	
Difficulties encountered by caregivers during oral hygiene:			
None	11(31.4%)	32(91.4%)	
Gag reflex	2(5.7%)	0(0%)	—-
Child does not permit	10(28.6%)	3(8.6%)	
Opening mouth	12(34.3%)	0(0%)	
Problem with teeth that caregivers report perceiving:			
Do not perceive	10(28.6%)	22(62.9%)	
Pain	1(2.9%)	1(2.9%)	—-
Tooth wear/Bruxism	2(5.7%)	0(0%)	
Caries/Stains	7(20.0%)	6(17.1%)	
Plaque and/or Tartar	4(11.4%)	3(8.6%)	
Malocclusion	11(31.4%)	3(8.6%)	

* *p*-value obtained through chi-square test.

** statistically significant ($p < 0.05$).

TABLE 3: Oral health status: occlusal characteristics, dmft/DMFT, caries severity and VPI.

Characteristics	SG (n=35)	CG (n=35)	*p*-value*
Midline n(%)			
Normal	29(82.9%)	30(85.7%)	*p*=0.743
Deviated	6(17.1%)	5(14.3%)	
Right molar relationship n(%)			
Angle Class I	7(35.0%)	19(82.6%)	*p*=0.002**
Angle Class II	12(60.0%)	2(8.7%)	
Angle Class III	1(5.0%)	2(8.7%)	
Left molar relationship n(%)			
Angle Class I	6(27.3%)	16(72.7%)	*p*<0.001**
Angle Class II	14(63.6%)	1(4.5%)	
Angle Class III	2(9.1%)	5(22.7%)	
Overbite n(%)			
Yes	3(8.6%)	0(0%)	*p*=0.077
No	32(91.4%)	35(100%)	
Overjet n(%)			
Yes	14(40.0%)	1(2.9%)	*p*<0.001**
No	21(60.0%)	34(97.1%)	
Anterior crossbite n(%)			
Yes	2(5.7%)	0(0%)	*p*=0.151
No	33(94.3%)	35(100%)	
Posterior crossbite n(%)			
Yes	3(8.6%)	3(8.6%)	*p*=1.000
No	32(91.4%)	32(91.4%)	
Anterior open bite n(%)			
Yes	17(48.6%)	2(5.7%)	*p*<0.001**
No	18(51.4%)	33(94.3%)	
Posterior open bite n(%)			
Yes	1(2.9%)	0(0%)	*p*=0.314
No	34(97.1%)	35(100%)	
dmft/DMFT index (mean±SD)	2.77±3.20	3.20±4.19	*p*=0.888
Caries severity n(%)			
Very low/low	20(57.1%)	19(54.3%)	*p*=0.789
Moderate	4(11.4%)	6(17.1%)	
High/very high	11(31.4%)	10(28.6%)	
VPI (mean±SD)%	46.17±28.57	21.61±16.66	*p*<0.001**

* *p*-value obtained through chi-square test for occlusal characteristics and caries severity and Mann-Whitney test for dmft/DMFT index and VPI.

** statistically significant ($p < 0.05$).

TABLE 4: Associations between caregivers' perceptions and caries activity, malocclusion, dental appointments and VPI.

		Group	Do you perceive any problem with his/her teeth? YES	NO	*p*-value*
Caries activity	**Yes**	**SG**	11(31.4%)	5(14.3%)	*p*=0.154
		CG	7(20.0%)	9(25.7%)	
	No	**SG**	14(40.0%)	5(14.3%)	*p*=0.009**
		CG	6(17.1%)	13(37.2%)	
Malocclusion	**Yes**	**SG**	19(54.3%)	8(22.9%)	*p*=0.091
		CG	4(11.5%)	6(17.1%)	
	No	**SG**	6(17.1%)	2(5.7%)	*p*=0.054
		CG	9(25.7%)	16(45.7%)	
Habit of visiting dentist	**Yes**	**SG**	11(31.4%)	5(14.3%)	*p*=0.153
		CG	12(34.3%)	14(40.0%)	
	No	**SG**	14(40.0%)	5(14.3%)	*p*=0.002**
		CG	1(2.8%)	8(22.9%)	
VPI (Mean±SD)%	50.84±5.11	**SG**	25(71.4%)	—-	*p*=0.011**
	27.97±6.50	**CG**	13(37.1%)	—-	
	34.50±10.63	**SG**	—-	10(28.6%)	*p*=0.272
	17.84±3.09	**CG**	—-	22(62.9%)	

* *p*-value obtained through chi-square test for caries activity, malocclusion and habit of visiting dentist and Mann-Whitney test for VPI.

** statistically significant ($p < 0.05$).

A significant difference between groups was found regarding the difficulty in performing oral hygiene: 68.1% of the caregivers in the SG reported difficulty, whereas 91.4% of the caregiver in the CG reported no difficulty. The most common problems encountered were gagging, limited mouth opening and resistance on the part of the child or adolescent. Indeed, caregivers of individuals with CP encounter a variety of difficulties during tooth brushing, such as the positioning of the head, involuntary tongue movements, difficulty spitting, a tendency to lock the jaws upon the insertion of the brush and communication difficulties[32].

Although the majority of caregivers in the SG reported difficulties, oral hygiene was not performed on only one individual. With regard to the method employed, the use of dental floss among the individuals with CP was uncommon. Caregivers in a previous study stated that they never used dental floss during oral hygiene.[2] In the present investigation, only 8.6% of the participants in the SG used dental floss, whereas 42.9% of those in the CG reported having this habit. Therefore, caregivers should be given instructions, training and motivation for the maintenance of daily oral hygiene and plaque control involving the use of dental floss and fluoride therapy. Ideally, an individual hygiene plan should be designed for each patient, including alternative head positioning techniques during brushing, the use of assistance devices, such as toothbrushes with a large handle, electric toothbrushes, mouth openers and dental floss supports[6,8].

Regarding the perception of oral health, the caregivers in the SG reported perceiving more problems with the teeth of the children and adolescents with CP than those in the CG. The severity of cognitive impairment increases the difficulty of individuals with CP in expressing their feelings and communicating the discomfort caused by oral problems, which makes caregivers feel that they are obligated to always be alert to any sign of anguish or discomfort[4,5].

Individuals with CP have a lower self-care capacity for oral hygiene due to abnormal tongue movements, low facial muscle tone and sialorrhea[24]. Moreover, the VPI was significantly higher in the SG compared to the CG, likely due to the difficulties the caregivers encountered when performing oral hygiene and the non-use of dental floss. Indeed, the insertion of any intraoral device was difficult in the patients with CP, which hindered the proper evaluation of gingival status and constitutes a limitation of the present study. The high VPI among the children and adolescents with CP explains the greater perception on the part of the caregivers of these individuals regarding dental problems and gingival bleeding in comparison to the caregivers in the CG. This finding is in disagreement with data described in some studies, which report a poor perception on the part of caregivers regarding changes in the gingival tissue[14,15]. In contrast, other studies found that 46% of caregivers perceived signs of gingival bleeding during the act of tooth brushing[33].

In the investigation of the association between caries activity and the perception of oral problems, although the majority of children and adolescents in the SG did not have active caries, the majority of the caregivers in the group reported perceiving dental problems. This finding suggests that the caregivers of individuals with CP perceive other problems beyond dental caries related to the oral cavity. The problem most indicated by the caregivers was malocclusion (31.4%). However, in the investigation of the association between malocclusion and the perception of oral problems on the part of the caregivers, no significant difference was found between groups. Based on the comments of the caregivers of individuals with CP, the malocclusion to which they were referring is not related to the poor relationship of the maxillary and mandibular dental arches, but rather the poor positioning of individual teeth (crowding), which was not a criterion for the determination of malocclusion in the present study. Du *et al* (2010)[13] found that caregivers demonstrated greater concern regarding the oral health of children and adolescents with CP compared to caregivers of those with typical development, suggesting that the orofacial characteristics associated with CP are the cause of considerable concern for caregivers.

A Class II molar relationship, overjet and anterior open bite were significantly more prevalent in the SG compared to the CG. These findings are in agreement with data described in previous studies, especially with regard to Class II malocclusion[2,34-36]. Indeed, malocclusion is among the more serious and frequent oral problems in individuals with CP[37], among which a Class II molar relationship, anterior open bite and overjet are the most common[34-36]. However, there is lack of a consensus on the factors that contribute to the development of occlusal problems in these patients. Some authors state that functional neuromuscular changes, particularly respiratory and swallowing problems, are related to the development of malocclusion, whereas others attribute malocclusion to low facial muscle tone and uncoordinated movements of the lips and tongue. However, when examining factors involved in the development of the dental occlusion, the resting or postural position of the head, especially hyperextension, exerts a decisive influence and may be responsible for various occlusal disorders in individuals with CP[34].

It is understandable that the oral health care needs of individuals with CP have to compete with other health needs[31]. The accessibility of individuals with special needs to dental treatment is difficult due to architectonic, urbanistic and transportation barriers as well as the scarcity of dentists trained to treat this population[16,28,29,38,39]. This difficulty in access to oral health care explains the fact that a considerable portion of caregivers in the SG declared perceiving problems in the teeth of the children and adolescents under their care yet did not have the habit of visiting a dentist. This is reflected in the data, as 74.3% of the children and adolescents in the CG were customarily taken to the dentist, whereas this figure was only 45.7% in the SG. Likewise, 57.1% of the individuals in the SG had only been to a dentist once, whereas 40% of those in the CG visited a dentist once a year. In a study by Cardoso *et al* (2011)[29], 65% of caregivers reported that dental treatment for individuals with disabilities is more difficult. The low level of dental treatment among individuals with CP underscores the importance of the inclusion of a dentist on the multidisciplinary team that provides care to this population. The access of children and adolescents with CP to quality dental treatment could be effective at preventing oral diseases, providing rehabilitation and reducing avoidable pain[24].

The present study has limitations that should be considered. The cross-sectional design does not enable the establishment of the causal relationship between socioeconomic, behavior and oral factors and the perceptions of caregivers of children and adolescents with CP. Although the sample was selected from the three major reference centers in the city of Santa Maria, only a small number of individuals with CP were examined and the results cannot be extrapolated to the general population with CP. However, no

epidemiological studies with external validity involving individuals with CP are found in the literature. Another possible limitation was the selection bias of the CG, as dental reference centers concentrate worse cases of oral health, but this limitation was minimized by matching the groups with regard to caries activity. Further investigations are needed to confirm the associations described herein and obtain a better understanding of caregivers' perceptions regarding the oral health of children and adolescents with CP.

Caregivers of children and adolescents with CP perceive more oral problems, such as visible plaque, gingival bleeding and malocclusion, than caregivers of children and adolescents with typical development. This suggests that orofacial characteristics associated with CP are the cause of greater concern for caregivers, but barriers regarding access to oral care impede the habit and frequency of visits to a dentist. Thus, there is a need for actions directed at improving access to dental services to promote social inclusion and enable the necessary oral health care for individuals with disabilities.

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