

Impact of parental care on oral health of children with Intellectual Disabilities from zero to six years of age

Impacto dos cuidados parentais na saúde bucal de crianças com Deficiência Intelectual de zero a seis anos de idade

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Resumo

Introdução: o nascimento de uma criança com deficiência intelectual exige dos pais a definição de suas funções em relação aos cuidados com a criança. **Objetivo:** investigar o quanto as práticas de cuidados parentais, características sociodemográficas, comportamentais e o conhecimento familiar podem ter impacto na saúde bucal de crianças com deficiência intelectual na faixa etária de zero a seis anos de idade. **Material e método:** foi avaliado o nível de ajuda cedida à criança na prática de higiene bucal de acordo com a escala de independência funcional adaptada. A Escala de Crenças Parentais e Práticas de Cuidado avaliou os cuidados primários e a estimulação oferecida à criança. Foram analisados a presença de placa dentária e o índice ceo-d. O nível de significância foi de 5%. **Resultado:** a porcentagem relativa de placa dentária foi de 11,4%. O índice ceo-d foi de 2. A prevalência de dentes com extração indicada é maior em crianças que recebem ajuda total para higienização, quando comparadas as que recebem ajuda máxima, moderada ou supervisão. Níveis mais elevados de placa dentária e dentes cariados foram encontrados nas crianças cujos pais avaliaram a saúde dental como ruim, a higiene como deficiente e quando acreditavam que os filhos podem sentir desconforto em razão de seu estado de saúde bucal. Baixa frequência de estimulação resultou em maior índice de placa e número de dentes cariados. **Conclusão:** a frequência de estimulação dos cuidados parentais influenciou na porcentagem do índice de placa e no número de dentes cariados nas crianças com deficiência intelectual.

Descritores: Assistência odontológica para pessoas com deficiências; deficiência intelectual; cuidados parentais.

Abstract

Introduction: the birth of a child with an intellectual disability requires the definition of the parents' roles in relation to the care of the child. **Objective:** evaluate how much parental care practices, sociodemographic and behavioral characteristics and family knowledge can have an impact on the oral health of children with intellectual disabilities in the age group from zero to six years of age. **Material and method:** the level of help given to the child in the practice of oral hygiene was evaluated according to the adapted functional independence scale. The Parental Beliefs and Care Practices Scale assessed primary care and stimulation offered to the child. The presence of dental plaque and the decay-missing-filled teeth (DMFT) index were analyzed. The significance level was 5%. **Result:** the relative percentage of dental plaque was 11.4%. The DMFT was 2. The prevalence of teeth with indicated extraction is higher in children who receive full assistance for cleaning, when compared to those who receive maximum, moderate help or supervision. Higher levels of dental plaque and decayed teeth were found in children whose parents rated their dental health as poor, hygiene as deficient, and when they believed their children might feel discomfort due to their oral health. Low stimulation frequency resulted in a higher plaque index and number of decayed teeth.



Conclusion: the frequency of parental care stimulation influenced the percentage of plaque index and the number of decayed teeth in children with intellectual disabilities.

Descriptors: Dental care for people with disabilities; intellectual disability; parental care.

INTRODUCTION

Intellectual Disability (ID) is diagnosed when the individual does not reach the expected developmental indicators in areas of intellectual functioning¹. According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), ID is characterized by deficits in abilities such as reasoning, problem solving, planning, academic learning and experience¹. Consequently, difficulties in adaptive functioning occur, and the individual does not reach values of personal independence and social responsibility¹.

The birth of a child makes changes in the routine of its caregivers and in the established relationships, requiring a process of adaptation from the family. In families composed of children with ID, there is a need to deal emotionally with the medical diagnosis adaptations and many alterations in routine habits². However, its severity levels can only be evaluated after early childhood, when it is possible to measure abilities through intelligence tests¹.

The diagnosis of ID can generate strong family crises and provoke negative feelings in the expectations and idealizations surrounding the arrival of a child³. In addition, child with ID changes plans, increases the responsibilities, and need for support from those responsible, and the requirement to define roles of care⁴. This care named in the literature as parental care refers to the relationship between parents and children involving needs such as caring, educating for provides development to their children⁴.

Recently, there has been an increase in research related to parental care and its repercussions on child development⁵. Studies on this topic point to an increase in caregivers' stress, resulting in changes to family functioning⁶. Mothers of children with ID prioritize the primary care related to hygiene, clothing and food^{5,6}. Thus, we emphasize the need of studies about parental care in families with children with ID.

Oral health is an integral and complementary part of an individual's general health, as well as quality of life at any stage of his life⁷. Several components of oral health are crucial to maintain a child's physical, mental health and well-being⁸. In this context, clinical studies showed elevated bacterial plaque, caries, periodontal diseases and worse rates of oral hygiene in children with ID^{7,8}.

Multiple factors can contribute to a higher risk of developing oral diseases in children with ID⁹. These factors include cognitive impairment, insufficient manual skill, incoordination, behavioral limitations, use of medication, pasty food and inadequate chewing and swallowing, with consequent accumulation of food in the oral cavity^{9,10}. Moreover, the dependence of caregivers add to their lack of motivation and comprehension for oral hygiene can contribute to many oral diseases¹¹.

Children's oral health habits originate mainly from family, thus the relationship between caregiver and child can be a positive or negative influence¹¹. An adequate assistance from the caregiver to carry out a well method of controlling bacterial plaque in people with ID can significantly contribute to the quality of oral hygiene. Therefore, parental care plays a fundamental and decisive role in promoting effective oral health habits^{9,11}.

MATERIAL AND METHOD

Ethics committee and sample selection

This is an observational cross-sectional study with a convenience sample following the rules of the STROBE Statement¹². This study was approved by the Research Ethics Committee of the Faculty of Dentistry of Araçatuba, UNESP (CAAE 49113021.5.0000.5420).

We studied 73 children from 0 to 6 years of age diagnosed with ID who attended the Baby Clinic of the Dental Assistance Center for Persons with Disabilities (CAOE - Centro de Assistência Odontológica à Pessoa com Deficiência) and their caregivers from August 2021 to April 2022. Those responsible were individually informed about the nature of the study and when they agreed to participate, they signed an informed consent form.

The individuals included in the study had the following inclusion criteria: Patients diagnosed with ID; patients with no need for sedation or restraint for examination; patients aged > 0 and ≤ 6 years; patients of both sexes.

Exclusion criteria were: Parents who did not authorize participation; caregivers with diagnosed psychiatric illness; edentulous patients; patients on an enteral or parenteral diet; institutionalized patients.

Data collect

Personal, sociodemographic and oral questionnaire

Questionnaire¹³ addressed questions about the child's identification, gender, age, address and whether they have other diseases associated with ID. Subsequently, through the account of the responsible, the level of help that the child receives in the practice of oral hygiene was evaluated according to the adapted functional independence scale¹⁴.

Additionally, based on a previous study¹³, an attempt was made to analyze the oral hygiene practices of children with questions associated with the frequency of daily brushing, dental floss and type of brush used, based on the parent's report. The caregiver's knowledge and understanding of children's oral health was also analyzed, through perception questions about oral hygiene and its relationship with general health, and the perception of any problem or discomfort in the mouth.

Parental Beliefs and Care Practices Scale (E-CPPC)

Relevant research⁴ built and validated a scale of the frequency and relevance attributed to two sets of care practices for children aged 0 to 6 years. One set concerns "primary care" practices and other concerns "stimulation" practices.

Behaviors related to primary care are: helping when crying; feed; keep clean; see to it that he sleeps and rests; don't let it get cold or hot; carry on the lap; always have them around; try to avoid any accident. The ones related to stimulation are: leaving free to run; swim; climb; do physical activities; play games; hanging toys in the crib; read small books together; show interesting things; explain things; listen to what they have to say; answer questions; face to face, eye to eye contact^{4,15}.

Thus, we have four different scores: First two from the primary care are frequency of performance and degree of importance. The second two from stimulation are frequency of performance and degree of importance^{4,15}.

For data analysis, variables were grouped according to a previous study methodology¹:
a) Primary care: 32-34 points: below average; 35-37 points: average; 38-40 points: above average.
b) Stimulation: 20-29 points: below average; 30-39 points: average; 40-50 points: above average.

Visible Plaque Index (VPI) and Decay-Missing-Filled (DMFT) index

As a clinical parameter for oral hygiene, VPI and DMFT indexes of all children in the study sample were evaluated. The evaluation was performed in the dental office of the CAOÉ and

¹Gomes JAM. Maternal perception of bond, beliefs and practices in situations of social vulnerability [dissertation]. Fortaleza: Universidade Federal do Ceará; 2018.

performed by two calibrated examiners obtaining a Kappa index of 0.90. They were performed with the aid of a number 5 mirror and WHO probe.

In the VPI, the presence of visible plaque was evaluated, determined by presence (+) or absence (-) in six teeth (first molars, maxillary central incisors, mandibular central incisors) in six locations per tooth (mesium-buccal, buccal, distobuccal, distolingual, midlingual and mesiolingual) totaling 36 sites¹⁶.

The DMFT index was performed on all teeth present, precisely observing the crown of each tooth. Its classification is according to the degree of severity: very low (average 0.0 to 1.1); low (mean 1.2 to 2.6); moderate (mean 2.7 to 4.4); high (mean 4.5 to 6.5); very high (mean 6.6 or more)¹⁶.

Statistical analysis

Simple Logistic Regression Model was performed for the outcomes: VPI, number of decayed teeth, filled teeth and with indicated extraction. The independent variables included in the analysis were sociodemographic factors (Age, sex and parental education) and behavioral factors (Degree of dependence, oral hygiene and dental floss).

Outcomes were compared to parents' knowledge of oral health using the Mann-Whitney U test and Kruskal-Wallis test. Correlations between E-CPPC scale and outcomes were performed using the Spearman test. Data are described by frequency distribution and means with standard deviations (SD).

Statistical analysis was performed using the JAMOVI 2.2.5 program (Sydney, Australia). The individual was the unit of analysis. The significance level was set at 5%. All values were tested for normality (Shapiro-Wilk test).

RESULTS

A total of 94 ID patients and their responsible agreed to participate in the study. Of these, 18 could not receive dental evaluation due to the enteral diet. Seventy-five children were eligible considering the inclusion and exclusion criteria; however, two patients were later excluded due to lack of cooperation in the clinical exam.

A total of 73 children (27 girls and 46 boys) aged between 0 and 6 years (mean age 2.25 ± 4.75 years) were included in the study. Thirty-five children had visible plaque, the relative percentage being 11.4%. All patients had some disease, syndrome or developmental change. Autism Spectrum Disorder (ASD) and Down Syndrome were the most common, affecting 37 patients (50.7%) and 13 patients (17.8%) respectively.

Patients aged 0-3 years had higher VPI compared to patients aged >3-6 years, 13.4% and 10% respectively (Table 1; $p = 0.03$). Children with Down Syndrome had a higher VPI and number of decayed teeth (Table 1; $p = 0.01$; $p = 0.02$).

Children who received full help to perform oral hygiene were more likely to have teeth with extraction indicated compared to those who received moderate help or supervision (Table 1; $p = 0.007$). Gender, parental education level and use of dental floss were not related to outcomes. None of the variables were associated with the number of filled teeth.

The VPI and the number of decayed teeth were significantly higher when parents indicated the health of the teeth as poor, oral hygiene as deficient, and when parents believed that their children might experience some type of discomfort due to their oral health condition (Table 2). None of the variables related to parental knowledge were associated with filled teeth and with indicated extraction.

Table 1. Distribution of VPI, decayed, filled teeth and indicated extraction

	Sample (n)	VPI (%)	p-value*	Decayed	p-value*	Filled teeth	p-value*	Indicated extraction	p-value*
Years old									
0 - 3	17	13.4	0.03	13	0.26	0	-	19	0.62
>3 - 6	56	11		64		11		43	
Sex									
Feminine	27	11.9		18		2		36	
Male	46	11.6	0.83	59	0.19	9	0.45	26	0.34
Parents' level of education									
Complete high school	30	12		61		10		60	
Incomplete high school	43	9	0.56	16	0.46	1	0.74	2	0.47
Degree of dependence									
Supervision									
Moderate help	3	7		1		0		20	
Full help	6	3.2		0		1		0	
Flossing									
Yes	64	12.2	0.30	76	0.24	10	0.17	42	0.007
No	2	19.5		6		0		0	
	71	11.2	0.45	71	0.15	11	0.74	62	0.71
Diagnostics									
Gaucher disease									
Down syndrome	1	0		0		0		0	
Epileptic	13	5	0.01	5	0.02	1		1	
encephalopathy									
Hyperactivity	1	0		0		0		0	
Microcephaly	3	5		2		0		0	
Micrognathism	3	10		2		0		0	
Congenital malformation	1	75	<0.001	0		0		0	
Cerebral Palsy	2	15		0		0		20	0.005
Autism spectrum	9	7.6		11		2		1	
Trisomy 18	37	12.7		45		6		32	
Delay in development	1	0		0		0		0	
	4	23.3		12		2	-	8	

*p-value, simple logistic regression.

Table 2. Knowledge about oral health and oral health status reported by parents

	VPI (mean ±SD)	p-value*	Decayed (mean ±SD)	p-value*	Filled teeth (mean ±SD)	p-value*	Indicated extraction (mean ±SD)	p-value*
Do you think your child may have a serious illness due to the oral condition?								
Yes	15.7±14.1		2.08±2.75		-		1.54±5.55	
No	11.2±15.9		0.88±1.74		0.15±0.71		0.79±2.85	
I don't know	5.16±9.68	0.147**	0.42±1.13	0.059**	0.42±0.78	0.081**	-	0.561**
Assessment of the health of the child's teeth								
Good	4.94±9.55		0.17±0.44		0.07±0.26		0.32±1.75	
Bad	19.3±17.1	<0.001*	2.12±2.48	<0.001*	0.24±0.93	0.762*	1.48±4.54	0.265*
Assessment of the child's oral hygiene								
Satisfactory	6.21±10.4		0.31±0.66		0.02±0.16		0.52±2.18	
Deficient	17.1±17.5	0.003*	1.86±2.51	0.002*	0.28±0.92	0.070*	1.2±4.27	0.381*
Oral condition brings some discomfort to the child								
Yes	19.0±14.0		2.15±2.17		0.11±0.43		1.88±5.06	
No	7.28±14.4	<0.001*	0.44±1.53	<0.001*	0.17±0.76	0.762*	0.27±1.61	0.265*

*Mann-Whitney U test; ** Kruskal-Wallis test.

The DMFT of this sample population is 2, being classified as low. However, considering the age group studied, this number is significant, since it shows 2 teeth affected by caries in each child. We found 77 decayed teeth, 11 filled and 62 with indicated extraction.

E-CPPC scale had an inversely proportional correlation ($r = -0.302$) between stimulation frequency and VPI (Table 3). This means above-average scores in children with lower VPI and below-average scores with higher VPI. The same correlation ($r = -0.321$) was observed in the stimulation frequency and number of decayed teeth (Table 4).

Frequency and importance of primary care could not be statistically correlated with the variables of oral condition. However, in the descriptive analysis most parents obtained points above average for these two scores, $n = 44$ and $n = 45$, respectively (Tables 3-4).

Table 3. Correlation of parental care and VPI

Classification	Frequency			Importance		
	n	VPI (mean±SD)	p-value*	n	VPI (mean±SD)	p-value*
<i>Primary Care</i>						
32-34 points: below average	11	7.07±12.5		7	6.76±12.2	
35-37 points: average	18	13.9±13.5		21	17.7±18.7	
38-40 points: above average	44	11.5±16.4	0.674	45	9.24±13.1	0.206
<i>Stimulation</i>						
20-29 points: below average	2	52.5±31.8		2	15±21.2	
30-39 points: average	23	15.3±15.4		5	12±16.4	
40-50 points: above average	48	7.8±11.3	0.009	66	11.3±15.2	0.911

*p value, Spearman correlation.

Table 4. Correlation of parental care and decayed teeth

Classification	Frequency			Importance		
	n	Decayed (mean±SD)	p-value*	n	Decayed (mean±SD)	p-value*
<i>Primary Care</i>						
32-34 points: below average	11	0.8±1.47		7	0.71±0.95	
35-37 points: average	18	1.6±2.3		21	1.38±2.31	
38-40 points: above average	44	0.8±1.8	0.29	45	0.95±1.89	0.23
<i>Stimulation</i>						
20-29 points: below average	2	1±1.41		2	1±1.41	
30-39 points: average	23	2±2.81		5	1.2±1.79	
40-50 points: above average	48	0.5±1.15	0.006	66	1±2	0.65

*p value, Spearman correlation.

DISCUSSION

The present study evaluated the VPI and the DMFT indexes of patients with ID who were under dental care at the CAOE Baby Clinic and how sociodemographic factors, parents' perception of oral condition and parental care practices can influence your children's oral health. Although parents were aware of their children's oral condition and had above average scores for the frequency and importance of parental care, inefficient control of dental plaque, decayed teeth and with indicated extraction were the main findings.

Most parents reported total support during oral hygiene of their children (87.7%). A similar proportion have been found in a previous study, where more than half of the caregivers (60.44%) also performed the toothbrushing on their children with ID¹⁷. Paradoxically, our results showed greater chance of having teeth with extraction indicated by caries in children whose cleaning is

performed with full help. This data evidenced parents' lack of knowledge, management, and techniques to effectively control the formation of dental plaque. Corroborating this work, other studies have shown unsatisfactory caregivers' attitude towards the oral health of patients with ID^{17,18}. Also, they highlighted the parents' difficulty for tooth brushing routine, due to the children's cooperation^{17,18}.

Stimulation with toys in the caregiver-child interaction aims to link the child to the world of objects and physical environment in general⁴. The aim is to promote cognitive development, as well as make the child more independent from social relationships⁶. Possibly, the correlation of below-average scores for stimulation frequency with high VPI and number of decayed teeth may be related to the fact that children in this group are more dependent to perform brushing. Since for this practice, there is a need to develop skills with objects such as brush, dental floss and toothpaste^{4,6,18}.

The association of the diagnosis of Down Syndrome with the visible plaque index, identified in our study, highlights the importance of oral hygiene in this group of patients. Notably, Down Syndrome patients have an altered inflammatory response in the presence of plaque, making them more susceptible to the development of periodontal disease¹³. Moreover, in the presence of dental plaque and decayed teeth, the parents rated the health of the teeth as poor, oral hygiene as deficient and stated that the child could feel some discomfort as a result of the oral condition. The findings of our study suggest a good perception of their children's oral condition, although this factor was not enough to maintain good oral hygiene in child with ID.

A recent study points to parents' lack of knowledge about adequate oral hygiene methods applicable to individuals with ID¹⁷. The lack of commitment due to the stress of life and parents' apprehension with other priorities, such as controlling epileptic seizures and feeding problems, can affect their children's oral health¹⁹. Based on research¹⁸⁻²⁰, our results suggest that as parents play a vital role in providing oral health support, there is a need to create educational interventions for them. Basic levels of hygiene education and the concept of caries and biofilm should be addressed in government public preventive programs. Also partnerships with private institutions aiming to reduce oral diseases in patients with ID. Future projects should emphasize management techniques and oral health education in specialized referral centers^{21,22}. Therefore, the data of the present study also suggest the adoption of more public policies for the prevention and promotion of oral health for families of children with ID.

The main limitation of this study was the sample. Only individuals who did not need sedation or restraint were included. Also, the sample was not divided into groups with mild, moderate or severe disability. A previous study showed a high risk for oral health problems in individuals who are unable to cooperate in routine dental care²³. Thus, if these patients had been included, this study would possibly have found worse oral health outcomes and, thus, we would have had more foundation to create educational methods for parents in view of the needs of each group. Future studies along these lines should be developed with the intention of resolving these conflicts.

The DMFT index found in our results was 2 teeth with caries experience in each patient, being classified as low. However, given the fact that the children studied were in early childhood, this data becomes relevant. Epidemiological studies carried out in older age groups revealed high rates of decayed, filled or extracted tooth surfaces in individuals with ID^{24,25}. Furthermore, they indicated more chances of extracted teeth according to oldness^{24,25}. Thus, the need for adequate care for patients with ID and their caregivers is reiterated. Preventive oral health measures can improve the general health of this patients for life.

A previous study reported higher risk of older patients with ID to have gingivitis and periodontal disease¹³. On the other hand, the data obtained in this study suggest that patients aged 0-3 years are more likely to have a dental plaque index than patients aged 3-6 years. Considering the deficiency of parents to understand oral hygiene measures, this relationship can explain this finding. Possibly, knowledge such as chronology of tooth eruption and the importance of cleaning teeth of babies can decrease plaque index. Recently, Ordinance No. 2,979 of November

12, 2019, established dental prenatal care within the scope of the Brazilian Unified Health System. Despite being directed to the dental treatment of pregnant women, the diffusion of oral health care can have a positive impact on the oral conditions of children with ID. Consolidating this proposition, another previous study associated the children's level of oral condition with the parents' level of education and hygiene knowledge²⁵.

CONCLUSION

Given the limitations of this study, it can be concluded that the parents were able to perceive the oral condition of their children. In addition, the frequency of parental care stimulation influenced the percentage of visible plaque and the number of decayed teeth in children with intellectual disabilities from zero to six years of age followed up at a specialized dental center.

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CONFLICTS OF INTERESTS

The authors declare no conflicts of interest.

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