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Factores asociados con la calidad de vida relacionada con la salud bucal en niños con discapacidad intelectual

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ABSTRACT: Different factors can influence the perception of quality of life in individuals with intellectual disabilities. This study investigated the factors associated with quality of life related to oral health in children with intellectual disabilities from the perspective of their parents. A cross-sectional study was carried out with Brazilian children from specialized institutions and their respective guardians. Data were collected through medical records, application of instruments and oral clinical examination (n=92). Most children had poor oral hygiene (64.10%) and a high caries experience (59.8%). The mothers' perception of quality of life related to oral health was low, however there was an association of greater perception when they had low education, female child, less brushing frequency and history of breastfeeding ($p \leq 0.05$). Although the perception of quality of life was low, the oral condition found evidences the need to promote oral health education actions with children with intellectual disabilities and their respective guardians.

KEYWORDS: Intellectual disability; Oral health; Dental caries; Oral hygiene; Quality of life.

RESUMEN: Diferentes factores pueden influir en la calidad de vida de personas con discapacidad intelectual. Este estudio investigó los factores asociados con la calidad de vida relacionada con la salud oral en niños con discapacidades intelectuales desde la perspectiva de sus cuidadores. Se realizó un estudio transversal con niños brasileños institucionalizados, que fueron evaluados clínicamente y sus respectivos tutores, quienes respondieron cuestionarios. Los datos fueron recolectados a través de registros médicos, aplicación de instrumentos de evaluación y examen clínico oral (n=92). La mayoría de los niños presentaban una higiene oral deficiente (64,10%) y una experiencia de caries alta (59,8%). Si bien la percepción específicamente de las madres respecto del impacto de las condiciones de la salud oral en la calidad de vida fue baja, mostró una tendencia a aumentar en cuanto disminuía el nivel educacional, la frecuencia de cepillado y la historia de lactancia materna ($p \leq 0.05$). El hecho de que la percepción del impacto en la calidad de vida por parte de los tutores no se condiga con las precarias condiciones de salud oral exhibida por los niños con discapacidad intelectual, no sólo demuestra el desconocimiento respecto de la importancia de la salud oral en un contexto general, sino que también evidencia la necesidad de promover acciones que incentiven el cuidado y educación en relación con este aspecto, tanto en los tutores como en los niños afectados.

PALABRAS CLAVE: Discapacidad intelectual; Salud bucal; Caries dental; Higiene bucal; Calidad de vida.

INTRODUCTION

Intellectual Disability (ID) is a disorder included in the group of developmental disorders, whose definition is based on intellectual function significantly below the average manifested before the age of 18, through limitations in at least one adaptive skill, or which present certain chronic conditions arising from mental and/or physical impairment (1). The term ID is used, in this context, as a synonym for learning disability (United Kingdom), mental retardation (Brazil) and mental disability (United States) (2).

Different clinical conditions must be considered for the conceptualization of ID, such as functional limitations and communication skills. The main diagnostic measure used in Brazil is based on the criteria established by the International Classification of Diseases and Related Health Problems (ICD-10) (3). ID can be classified as mild, moderate, severe,

and profound mental retardation, in addition to the unspecified (significant impairment of behavior, requiring surveillance or treatment) (3).

Associated with physical or environmental factors, ID is characterized as the most common disorder capable of inhibiting or hindering the active participation of the carrier in society (4). Estimates about the prevalence of this condition vary according to the inclusion criteria and the methodologies used (5). In Brazil, epidemiological studies with ID patients are scarce, but national estimates indicate that the incidence of this condition is 11.5 per 100 live births (6).

In children with ID, the slower rate of development affects learning, interaction, and communication with others people (2). The risk factors identified in children with ID include lower IQ, lower communication skills, higher incidence of medical illnesses, and difficulties in social interaction

or behavioral problems (7). Consequently, these restrictions can lead to dysfunction in self-care and make these children dependent on others for their activities of daily living (8), which can influence the quality of life of this group (9). International literature has shown that ID patients can have a reduced quality of life (9,10,11). Some factors may influence this situation, and, in addition to risk factors, social, economic, and demographic characteristics may be associated with the quality of life of these individuals (12).

The involvement of ID does not only affect children themselves but also their families (13). Children affected by the condition need more care, and their parents experience more stress when caring for them (14). In most cultures around the world, women have more responsibility for raising children, and the main caregivers/caregivers of children with ID are usually mothers (15). When facing children's problems, mothers can experience situations of physical and mental stress, which also affects the quality of life of these caregivers (16).

Oral health is another fundamental aspect of quality of life, and this is particularly consistent for people with intellectual disabilities (17). ID patients, especially those with associated motor limitations (18), have worse oral hygiene conditions and a higher incidence of oral diseases (19). Couto *et al.* (2018) evaluated the quality of life of Portuguese ID and observed that in more than half of individuals, oral health had a significant impact on quality of life (20).

In this context, this study seeks to evaluate the factors associated with the quality of life-related to the oral health of children with intellectual disabilities from the perspective of their parental-caregivers.

MATERIALS AND METHODS

STUDY DESIGN

This is a cross-sectional study, in which data collection was carried out through dialogued interviews with the heads of children with ID and oral clinical examination in them. The survey was carried in six institutions to support people with disabilities (PWD) in the state of Sergipe, Brazil.

The variables related to the social context of the guardians were age, marital status, education, income, and the number of children. Variables on children include age, gender, hygiene, and eating habits, as well as a history of breastfeeding. The independent variables studied were dichotomized according to the median or were grouped into categories according to homogeneity or frequency distribution to verify the association between the outcome. The number of Brazilian minimum wages (R\$ 937.00 = \$ 172,00 – in July 2020) received per family was considered a parameter for socioeconomic status.

SAMPLE AND RECRUITING

The study consisted of a convenience sample, formed by pairs of children with mental retardation and their mothers, duly registered and attended at the institutions supporting the PWD in the municipalities of Aracaju and Nossa Senhora do Socorro selected for this study.

The initial survey estimated that there were 134 children diagnosed with mental retardation, aged 6 to 12 years, of both sexes, enrolled in government institutions in the cities of Aracaju and Nossa Senhora do Socorro. The choice of support

units for PWD in the respective municipalities occurred due to the social representativeness of these institutions since they serve a large part of the disabled population of the municipalities included in this study, as well as the lack of health information in this group in Brazilian computerized databases. The final sample number of this study was composed of 92 pairs of responsible children. Furthermore, the data obtained in the study by Racy (2016) was used as a basis, which provided this study with 90% statistical power to test a difference of 11.7 means with 95% two-tailed reliability parameters (21).

Those responsible for the children were contacted by phone, informed about the study and, upon acceptance, a meeting was held with those who spent the most time taking care of the children to present the research objectives.

INCLUSION AND EXCLUSION CRITERIA

To be eligible for the study, participants had to meet the following inclusion criteria: be registered in the institutions covered by the study, be included in the age group between 6 and 12 years old, present a medical diagnosis of mental retardation (ICD-10 code: 79) and not have any other type of disability (3). The medical diagnosis of mental retardation was obtained through the medical records provided by the institutions. Also, guardians should spend at least 12 hours a day with the child.

Participants were excluded due to the lack of information in the clinical record, the inability to attend the place where the study was being conducted, and the refusal to participate.

DATA COLLECTION

Data collection was carried out in two stages: (i) dialogue interview for the application of questionnaires for socioeconomic, demographic,

psychosocial assessment, eating and hygiene habits, and history of breastfeeding with parents-caregivers; (ii) oral clinical examination to assess oral hygiene and dental caries in children. Both steps were performed by the same evaluator.

DIALOGUE INTERVIEW

Upon prior appointment, the interviews took place in person at the institutions, before the children's oral clinical examination. The questionnaires were applied by a pair of evaluators, previously trained in the reading and intonation of each question, and the answers to the printed instruments.

In the questionnaire, the questions addressed to the responsible persons evaluated the socio-demographic and economic conditions based on the criteria established by the National Health Survey of Brazil of the Brazilian Institute of Geography and Statistics (Instituto Brasileiro de Geografia e Estatística-IBGE).

Data on quality of life and impact on the family were collected using the Brazilian versions of the Parental-Caregiver Perceptions Questionnaire (P-CPQ) and the Family Impact Scale (FIS) (22, 23).

The P-CPQ is a reliable measure that assesses the parent caregiver's perception of the quality of life about children's oral health. In general, it consists of an automatic questionnaire, composed of 33 questions, using the 5-point Likert-type answer options, which assess the perceptions of parents-caregivers about the impacts of oral diseases on the quality of life of children and adolescents from 6 to 14 years. The 33 items of the P-CPQ are distributed in different subscales, which are: "oral symptoms" (OS), "functional limitation" (FL), "emotional well-being" (E-WB) and "social well-being" (S-WB) (22).

For the P-CPQ scale, the final score ranges from 0 to 124, with high scores indicating a greater

negative perception of caregivers concerning the quality of life-related to their children's oral health (22). The FIS is an evaluation scale that analyzes the effects of children's oral disorders on the functioning of their family, referring to the frequency of events in the previous three months. The instrument consists of 14 items divided into four domains: parent/family activity, parent/family emotions, family conflict, and financial burden. The final score for the FIS scale ranges from 0 to 56, where the highest score means the greatest impact of the child's oral condition on the family's quality of life (23).

ORAL CLINICAL EXAMINATION

The oral clinical examination was carried out by the evaluators of the Postgraduate Program in Dentistry at the Federal University of Sergipe, in an environment with natural lighting, with the use of an odontoscope, spherical tip probe (0.5mm), cotton and surgical gloves. According to the criteria established by the World Health Organization, the verification of the experience of dental caries and oral hygiene was measured through the Index of Decayed, Lost and Filled Teeth for primary dentition (dmft) and permanent dentition (DMFT), and Oral Hygiene Index (OHI-S), respectively.

For children with mixed dentition, the caries index was assessed by the sum of the components $d + m / D + M + F$. The dmft / DMFT was categorized according to the experience of dental caries: dmft / DMFT 0 = caries-free; 1 to 2 = low experience; from 3 to 4 = moderate experience and ≥ 5 = high experience.

The condition of oral hygiene, assessed by the OHI-S index, is based on the amount of debris (DI-S) and dental calculations (CI-S) that affect the six representative surfaces of the teeth in the mouth. The surfaces examined for OHI-S were selected from four posterior and two anterior teeth (first right upper molar, right upper central incisor,

first left upper molar, lower left central incisor, first left lower molar, and first left lower molar). The vestibular surfaces were examined for all teeth, with the exception of the lower molars, where the lingual surfaces were examined.

The OHI-S value was organized from the sum of DI-S and CI-S. The oral hygiene index can vary between 0 to 3.0 and be classified as good oral hygiene (0 to 0.6), regular oral hygiene (0.7 to 1.8) or poor oral hygiene (1.9 to 3.0), according to the model suggested by Greene and Vermillion (24).

STATISTICAL ANALYSIS

Statistical analysis was performed using the Statistical Package for the Social Sciences software (IBM® SPSS 25.0 for Windows, Inc., Chicago, IL, USA). The Shapiro-Wilk test was adopted to verify normality and demonstrated that the quantitative dependent variable, total P-CPQ score, presented a non-parametric distribution.

Descriptive data were expressed as absolute and relative frequency, median and interquartile range. Inferential statistics was tested using Mann-Whitney U test and the Kruskal-Wallis, followed by the Bonferroni correction. The level of significance was considered when $p < 0.05$.

ETHICAL ASPECTS

This study was carried out by the principles of the Declaration of Helsinki and with Resolution 196/1996 of the National Health Council of Brazil (Conselho Nacional de Saúde do Brasil), receiving a favorable opinion from the Research Ethics Committee of the Federal University of Sergipe, under the number of order approval protocol 1.639.022. After obtaining permission from each institution involved in the study, the participants who agreed to participate in the research signed the Free and Informed Consent Form.

RESULTS

Among the 134 children and their parents-caregivers eligible for the study, 4 (3.7%) children were hospitalized, 16 (11.9%) did not present their medical records properly filled out and 21 (15.6%) parent-caregivers refused to participate in the study. Finally, the sample consisted of 92 pairs of children and their guardians, 100% of whom were mothers.

Most mothers were under 40 years old (58.6%), were married (60.8%) and had 5 to 9 years of study (68.4%). They had more than 3 children (38.1%) and received less than one Brazilian minimum wage per family on a monthly basis (82.6%) (Table 1).

Regarding children, most were between 10 and 12 years old (75.0%), were female (66.3%), performed daily self-care activities in oral hygiene (92.3%), had daily brushing frequency of once a day (75.0%), with a history of breastfeeding (64.1%), bottle use (85.8%) and daily fruit consumption (51.9%) (Table 1).

The mean of the global P-CPQ was higher among mothers with more than 9 years of study ($p=0.022$), in female children ($p=0.012$), who were breastfed ($p=0.018$) and who brushed their teeth

through least once a day ($p=0.011$). The FIS was not associated with any of the child's sociodemographic and behavioral variables (Table 2).

The global mean P-CPQ score in the sample was 23.28 ± 7.0 . Among the subscales, functional limitation and oral symptoms had the highest averages 12.07 ± 3.67 and 11.04 ± 4.20 , respectively. The average FIS score was 0.64 ± 3.73 (descriptive data not shown in the table). Considering each subscale of the P-CPQ, only the impact on functional limitation was associated with mothers' education ($p=0.004$) and breastfeeding ($p=0.038$) (Figure 1).

As for oral health, 40.2% of children were found without caries disease, while 30.5% and 29.3% had low/moderate and high caries experience, respectively. There was no association between the severity of dental caries and the mean global P-CPQ and the subscales of the instrument ($p>0.05$) (Table 3).

The condition of oral hygiene was observed as good in 29.3% of the children, 6.5% as regular and 64.1% as poor, however, there was no association between the average perception of those responsible for health-related quality of life oral health of children and their subscales ($p>0.05$) (Table 3).

Table 1. Characteristics of caregivers and children included in the study (n=92). Brazil, 2020.

Variables	n	%
Parental-caregiver		
<i>Age</i>		
< 40 years	54	58.6
≥ 40 years	38	41.4
<i>Marital status</i>		
Single	21	22.8
Married	61	66.3
Separated/divorced/widowed	10	10.9
<i>Schooling level (years of study)</i>		
0-4	8	8.7
5-9	63	68.5
≥9	21	22.8
<i>Number of children</i>		
One	28	30.4
Two	29	31.5
Three or more	35	38.1
<i>Family income</i>		
≤ One BMW#	76	82.6
>One BMW	16	17.4
Children		
<i>Age</i>		
Up to 9 years	23	25.0
Between 10 to 12 years	69	75.0
<i>Gender</i>		
Female	61	66.3
Male	31	33.7
<i>Independence in daily oral hygiene</i>		
Yes	85	92.3
No	7	7.7
<i>Brushing frequency</i>		
1 time a day	69	75.0
2-3 times a day	23	25.0
<i>History of breastfeeding</i>		
Yes	59	64.1
No	33	35.9
<i>Bottle-feeding</i>		
Yes	79	85.8
No	13	14.2
<i>Daily fruit consumption</i>		
Yes	47	51.9
No	45	48.1

Results are expressed in absolute (n) and relative (%) frequency; #BMW: Brazilian minimum wage.

Table 2. Median and interquartile range (IQR) between sociodemographic and economic characteristics, eating habits, oral hygiene practices and breastfeeding history for P-CPQ and FIS (n=92). Brazil, 2020.

Variables	n	%	Overall P-CPQ	P-value	FIS	P-value
Parental-caregiver						
Age						
< 40 years	54	58.6	26.00 (22.00; 26.00)	0.642 [£]	0.00 (0.00; 0.00)	0.808 [£]
≥ 40 years	38	41.4	26.00 (22.00; 26.00)		0.00 (0.00; 0.00)	
Marital status						
Single	21	22.8	26.00 (22.00; 27.00)	0.447 [§]	0.00 (0.00; 0.00)	0.870 [§]
Married	61	66.3	26.00 (23.50; 27.80)		0.00 (0.00; 0.00)	
Separated/divorced/widowed	10	10.9	26.00 (23.50; 26.00)		0.00 (0.00; 0.00)	
Schooling level (years of study)						
0-4	8	8.7	24.00 (22.00; 26.03) ^a	0.042 [§]	0.00 (0.00; 0.00)	0.985 [§]
5-9	63	68.5	26.00 (22.00; 26.00) ^b		0.00 (0.00; 0.00)	
≥9	21	22.8	28.00 (24.00; 30.00) ^b		0.00 (0.00; 0.00)	
Number of children						
One	28	30.4	24.00 (22.00; 26.00)	0.114 [§]	0.00 (0.00; 0.00)	0.957 [§]
Two	29	31.5	26.00 (23.00; 28.00)		0.00 (0.00; 0.00)	
Three or more	35	38.1	26.00 (22.00; 26.00)		0.00 (0.00; 0.00)	
Family income						
≤ One BMW#	76	82.6	26.00 (22.00; 26.00)	0.647 [£]	0.00 (0.00; 0.00)	0.932 [£]
>One BMW	16	17.4	25.00 (22.00; 26.00)		0.00 (0.00; 0.00)	
Children						
Age						
Up to 9 years	23	25.0	24.00 (18.00; 27.00)	0.528 [£]	1.70 (±6.30)	0.118 [£]
Between 10 to 12 years	69	75.0	26.00 (22.00; 26.00)		0.29 (±2.28)	
Gender						
Female	61	66.3	26.00 (24.00; 26.00)	0.012 [£]	0.79 (±4.40)	0.508 [£]
Male	31	33.7	22.00 (18.00; 26.00)		0.35 (±1.79)	
Independence in daily oral hygiene						
Yes	85	92.3	26.00 (22.00; 26.00)	0.279 [£]	0.88 (±4.22)	0.797 [£]
No	7	7.7	26.00 (24.00; 28.00)		0.00 (±0.00)	
Brushing frequency						
1 time a day	69	75.0	24.00 (22.00; 26.00)	0.022 [£]	0.86 (4.29)	0.344 [£]
2-3 times a day	23	25.0	21.05 (10.00; 24.00)		0.00 (±0.00)	
History of breastfeeding						
Yes	59	64.1	26.00 (24.00; 26.00)	0.018 [£]	1.09 (±4.25)	0.657 [£]
No	33	35.9	24.00 (21.00; 26.00)		0.66 (±3.97)	
Bottle-feeding						
Yes	79	85.8	26.00 (22.00; 26.00)	0.728 [£]	0.58 (±2.97)	0.862 [£]
No	13	14.2	24.00 (21.00; 26.00)		2.23 (±8.04)	
Daily fruit consumption						
Yes	47	51.9	26.00 (22.00; 26.00)	0.774 [£]	1.23 (±5.17)	0.120 [£]
No	45	48.1	26.00 (22.00; 26.00)		0.02 (±0.14)	

#BMW: Brazilian minimum wage; £ Mann-Whitney Test; § Kruskal-Wallis; Different letters mean statistically different results (p<0.005); significance values were adjusted using the Bonferroni correction.

Table 3. Distribution of the median and interquartile range of the P-CPQ and FIS scores in relation to dental caries and oral hygiene (n=92). Brazil, 2020.

Clinical condition	n	%	Overall P-CPQ (±SD)	OS*	FL*	E-WB*	S-WB*	FIS
Severity of dental caries (dmft/DMFT)								
Caries free	37	40.20	26.00 (22.00; 26.00)	12.00 (11.00; 12.00)	14.00 (10.00; 14.00)	0.00 (0.00; 0.00)	0.00 (0.00; 0.00)	0.00 (0.00; 0.00)
Low experience	17	18.60	26.00 (22.00; 26.00)	12.00 (12.00; 12.00)	12.00 (10.00; 14.00)	0.00 (0.00; 0.00)	0.00 (0.00; 0.00)	0.00 (0.00; 0.00)
Moderate experience	11	11.90	26.00 (22.00; 26.00)	12.00 (12.00; 12.00)	14.00 (10.00; 14.00)	0.00 (0.00; 0.00)	0.00 (0.00; 0.00)	0.00 (0.00; 0.00)
High experience	27	29.30	26.00 (22.00; 26.00)	12.00 (12.00; 14.00)	12.00 (12.00; 14.00)	0.00 (0.00; 0.00)	0.00 (0.00; 0.00)	0.00 (0.00; 0.00)
P-value§			0.903	0.143	0.984	1.000	1.000	1.000
Oral hygiene (OHIS-S)								
Good	27	29.30	26.00 (22.00; 26.00)	12.00 (10.00; 12.00)	12.00 (10.00; 14.00)	0.00 (0.00; 0.00)	0.00 (0.00; 0.00)	0.00 (0.00; 0.00)
Fair	6	6.60	24.00 (24.00; 26.75)	12.00 (11.50; 12.00)	13.00 (12.00; 14.00)	0.00 (0.00; 0.75)	0.00 (0.00; 0.00)	0.00 (0.00; 0.00)
Poor	59	64.10	26.00 (22.00; 26.00)	12.00 (12.00; 12.00)	12.00 (10.00; 14.00)	0.00 (0.00; 0.00)	0.00 (0.00; 0.00)	0.00 (0.00; 0.00)
P-value§			0.665	0.323	0.782	1.000	1.000	1.000

*OS: Oral symptoms; FL: Functional limitations; E-WB: Emotional well-being; S-WB: Social well-being; § Kruskal-Wallis.

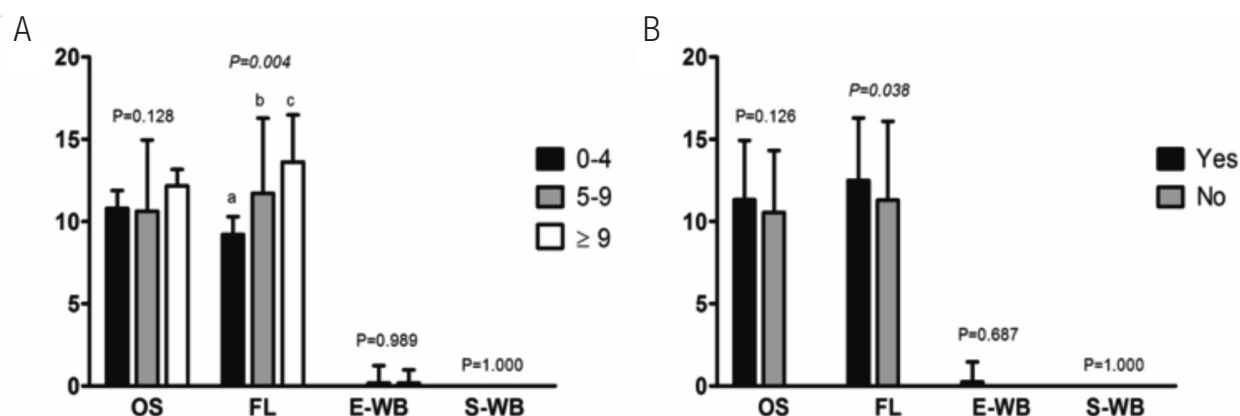


Figure 1. Subscales median scores for P-CPQ in relation to (a) schooling level and (b) history of breastfeeding. Different letters mean statistically different results ($p < 0.005$); significance values were adjusted using the Bonferroni correction. OS=Oral symptoms; FL=Functional limitations; E-WB=Emotional well-being; S-WB=Social well-being. Brazil, 2020.

DISCUSSION

The results found to reflect poor oral health conditions in children with ID, with a high presence of dental biofilm and caries experience. Mothers' perception of the impact of the oral condition on the child's and family's quality of life was low, however, the average perception of oral condition on the child's quality of life was observed among those with a higher level of education, responsible for sex children female, with a history of breastfeeding and who brushed their teeth less frequently. Regarding the dimensions assessed by the P-CPQ subscales, the impact of functional limitations was also associated with the mothers' education level and history of breastfeeding.

In this study, it was observed that most children had regular or poor oral hygiene, which corroborates the results found in a meta-analysis that confirmed that children with ID had significantly higher levels of dental biofilm than those without ID (25). National and international studies have also reported that ID patients tend to have poor oral hygiene, in addition to a high rate of experience of caries and periodontal disease, as well as a greater number of extractions and fewer restorative procedures when compared to the general population (26, 27).

The process of developing dental diseases in individuals with ID does not differ from those who do not have any disabilities. Similarly, both prevention and treatment modalities among these individuals do not differ, and the main factor related to oral problems in people with disabilities is the inadequate removal of dental biofilm (22).

The high experience of dental caries in this study was observed in 29.3% of children, higher estimate than those found in the local literature (28) and lower than the global values (29) literature. The Brazilian study by Batista et al. (2009), reported a strongly compromised dentition and unsatisfactory oral health in 24% of the children evaluated and with mental retardation, using the WHO criteria (28). Also, other studies that evaluated the oral health condition in Brazilian children from other groups of intellectually disabled people, such as those with Autism Spectrum Disorder and Down Syndrome, demonstrated a high caries experience present in 37.05% and 44.20% of the sample, respectively (30,31).

In addition to specific factors, such as functional and communication limitations, studies correlate the high experience of dental caries in intellectually disabled people with the social,

demographic, and economic context of those responsible (32). These families are generally socially and emotionally disadvantaged, with this they have little knowledge of health, increasing the chances of triggering oral diseases among these patients (33). Also, it should be noted that the lack of parental guidance regarding the need for comprehensive care, the difficulty in understanding the effects of behavior on health and the benefits of dental treatment, may be factors that reflect the high caries experience in this group, as well as the process of access to adequate health services (34).

Parents-caregivers are the most influential models for their children, and the habits adopted during childhood, when the child is dependent on the guardian, are the powerful means to establish a new behavior in the child's routine, such as brushing. As a result, guardians need to have an adequate attitude and knowledge about oral health, to instigate good oral habits in their children (35). In this context, it is reinforced again that the social determinants of the guardians can influence the way they observe the oral condition of their children (36).

Several factors have been described as predictors of parents' perception of the oral health of children without disabilities, such as the child's age and sex, family income, ethnicity, and different oral health problems (37,38). However, the literature is not clear in relation to the factors associated with the perception of those responsible for the impact of oral health on the quality of life of children with ID. The study by Pani *et al.* (2013) assessed the perception of parents-caregivers of autistic children and found that the age and educational level of the parents was associated with a greater negative perception of the impact of oral health on children's quality of life (36). With similar characteristics, Aggarwal *et al.* (2016) observed the impact of oral health conditions on the quality of children with ID and their families and can conclude that the child's oral health perception

can be influenced by the family's socioeconomic status (32).

Among the sociodemographic variables assessed in this study, only the level of education was associated with a greater perception of the impact of oral conditions on children's quality of life, pointing out that those with less education perceive the impact of oral conditions on their children's lives less, as well as low education, reduces the search for dental care and self-care in oral health (39). According to more years of schooling among those responsible, the greater the chances of access to health information, as well as the promotion of better self-care, which can have a positive effect on the perception of the impact of oral conditions on the child's quality of life (39). In this circumstance, the low level of education observed in the caregivers of children and adolescents with ID is due to the need for these individuals to abandon their studies to dedicate themselves to the integral role of caregiver, which leads to low levels of information and self-care with the child health (40).

The lower frequency of brushing among children can trigger several oral disorders and, consequently, more complaints of pain or discomfort, and only then do the caregivers become more aware of the impact of oral conditions on their quality of life. Linked to this, those with lower education levels may not be properly oriented to intervene and promote adequate oral hygiene for children, considering the fact of little or no knowledge in health, but it should be emphasized that health education can act as a tool transformed in changing habits and appropriate attitudes in the caregivers' routine (41,42).

The average perception of those responsible for the impact of oral health on the quality of life of female children was higher when compared to male children. This result corroborates with those

found in other studies and demonstrates that women complain more about oral problems that affect them (43). Also, this may be because girls have a higher prevalence of hormonal changes that can influence their oral health, in addition to greater demands on the aesthetic appearance of the smile, which make them more sensitive to the presence of caries and consequently, it causes greater complaints about his oral condition (43,44).

A meta-analysis, involving approximately 400 studies, showed that breastfeeding has several positive effects for the child, improves the affective bond between mother and child, and reduces the risk of respiratory infections and obesity (45). Also, functional stimuli arising from breastfeeding, such as sucking, chewing, swallowing, and breathing are related to craniofacial growth, as well as being associated with the correct development of dentofacial structures (46).

In our sample, breastfeeding was associated with a greater perception of caregivers about the influence of functional limitations on the child's quality of life. This may be related to the fact that breastfeeding mothers observe more the child's oral cavity during breastfeeding (47), being able to identify the presence of several oral problems, such as mouth sores, parafunctional habits, gingival bleeding, difficulty in biting, chewing, swallowing or eating food (48). Although this study did not evaluate breastfeeding duration, an association was recently found between longer breastfeeding duration and a greater perception of children's oral health (47,49).

The results suggest that the impact of oral health-related quality of life was greater at the individual than at the family level. It is also observed that those responsible did not report the impact of oral health on the social well-being of children, and this can be attributed to numerous factors, among them

the fact that the low level of education of parents affects the perception of children's oral conditions and the lack of knowledge about what a proper oral condition looks like. Also, the "I don't know" responses reported were included, but considered absent, which may contribute to the result found and be justified by their low level of education.

One of the limitations of this study is that its transversal character makes causal inferences impossible. In addition to this, the absence of a control group and the use of a sample for convenience increases the possibility of bias. The assessed sample was deliberately limited to those referred to specialized health services, providing a group of individuals with a higher prevalence of potential risk factors for oral health problems when compared to other groups in the general population. Also, the present study did not assess the severity of the patients' general clinical condition, since such information was not available in the medical records of children with ID, however some previous studies did, and a greater impact was observed among patients with greater disease severity (32).

CONCLUSION

The results found in this study emphasize the need for understanding and training of caregivers about their active role in the proper maintenance of children's oral condition. Considering the high experience of caries and poor oral hygiene among children with ID, as well as the influence of different factors on the perception of those responsible for the impact of oral conditions on their children's lives, it is necessary to promote the importance of health oral health for general health. Also, the importance of looking for dental care services, adequate and supervised brushing and healthy eating habits to limit the progression of dental caries and other oral disorders in the population with intellectual disabilities should be reinforced.

REFERENCES

1. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders (5th ed.) 2013.
2. Bhaumik S., Branford D., Barrett M., & Gangadharan S.K. The Frith Prescribing Guidelines for People with Intellectual Disability. Wiley Online Library. 2013.
3. World Health Organization. ICD-10: International Statistical Classification Of Diseases And Related Health Problems. 2004.
4. Lin L.P., and Lin J.D. Perspectives on intellectual disability in Taiwan: epidemiology, policy and services for children and adults. *Curr Opin Psychiatr*; 24 (5), 413-418. 2011.
5. Matson J.L., and Shoemaker M.E. Psychopathology and intellectual disability. *Curr Opin Psychiatr*; 24 (5), 367-371. 2011.
6. Instituto Brasileira de Geografia e Estatística - IBGE. Pesquisa Nacional de Saúde do Brasil: Ciclos de Vida. 2015.
7. Hauser-Cram P., Warfield M.E., Shonkoff J.P., Krauss M.W., Sayer A., Upshur C.C. Children with disabilities: a longitudinal study of child development and parent well-being. *Monogr Soc Res Child Dev*; 66 (3): i-126. 2001.
8. Davis E., Shelly A., Waters E., et al. The impact of caring for a child with cerebral palsy: quality of life for mothers and fathers *Child Care Health Dev*; 36(1):63-73. 2010.
9. Bertelli M. & Brown I. Quality of life for people with intellectual disabilities. *Curr Opin Psychiatr*; 19 (5), 508-513. 2006.
10. Hong J., Bishop-Fitzpatrick L., Smith L.E., Greenberg J.S., Mailick M.R. Factors Associated with Subjective Quality of Life of Adults with Autism Spectrum Disorder: Self-Report Versus Maternal Reports. *J Autism Dev Disord*. 2016; 46 (4): 1368-1378.
11. Morisse F., Vandemaele E., Claes C., Claes L., Vandevelde S. Quality of life in persons with intellectual disabilities and mental health problems: an explorative study. *Scientific World Journal*. 2013.
12. Boehm T.L., Carter E.W. Family Quality of Life and Its Correlates Among Parents of Children and Adults With Intellectual Disability. *Am J Intellect Dev Disabil*. 2019; 124 (2): 99-115.
13. Gardiner E., Iarocci G. Unhappy (and happy) in their own way: a developmental psychopathology perspective on quality of life for families living with developmental disability with and without autism. *Res Dev Disabil*. 2012; 33 (6): 2177-2192.
14. Karande S., Kulkarni S. Quality of life of parents of children with newly diagnosed specific learning disability. *J Postgrad Med*. 2009; 55 (2): 97-103
15. Ones K., Yilmaz E., Cetinkaya B., Caglar N. Assessment of the quality of life of mothers of children with cerebral palsy (primary caregivers). *Neurorehabil Neural Repair*. 2005; 19 (3): 232-237.
16. Prudente Cejane Oliveira Martins, Barbosa Maria Alves, Porto Celmo Celeno. Relation Between Quality of Life of Mothers of Children With Cerebral Palsy and the Children's Motor Functioning, After Ten Months of Rehabilitation. *Rev. Latino-Am. Enfermagem*; 18 (2): 149-155. 2010.
17. Knekt N.C., Lobbezoo F., Schuengel C., Evenhuis H.M., Scherder E.J.A. Self-Reported Presence and Experience of Pain in Adults with Down Syndrome. *Pain Med*; 18 (7): 1247-1263. 2017.

18. Oliveira J.S., Prado-Júnior R.R., Sousa L.K.R., Oliveira A.H., Moita N.J.M., Mendes R.F. Intellectual disability and impact on oral health: a paired study. *Spec Care Dentist*; 33 (6), 262-268. 2013.
19. Anders P.L. and Davis E.L. Oral health of patients with intellectual disabilities: a systematic review. *Spec Care Dentist*; 30 (3), 110-117. 2010.
20. Couto P., Pereira P.A., Nunes M., Mendes R.A. Oral health-related quality of life of Portuguese adults with mild intellectual disabilities. *PLoS One*; 13 (3): e0193953. 2018.
21. Racy M.M. Saúde bucal e qualidade de vida em indivíduos com paralisia cerebral e Síndrome de Down: percepção dos cuidadores [dissertation]. Araraquara, SP: - Universidade Estadual Paulista; 2016.
22. Goursand D., Paivai S.M., Zarzar P.M., Pordeus I.A., Grochowski R., Allison P.J. Measuring parental-caregiver perceptions of child oral health-related quality of life. *Braz Dent J*; 20 (2):169-174. 2009.
23. Goursand D., Paiva S., Zarzar P., Pordeus I., Allison P. Family Impact Scale (FIS): psychometric properties of the Brazilian Portuguese language version. *Eur J Oral Sci*; 10 (3):141. 2009.
24. Greene J.G., Vermillion J.R. The simplified oral hygiene index. *J Am Dent Assoc*; 68 (1): 7-13. 1964.
25. Mathias M., Simionato M., Guare R. Some factors associated with dental caries in the primary dentition of children with Down syndrome. *Eur J Paediatr Dent*; 12 (1): 37. 2011.
26. Ummer-Christian R., Iacono T., Grills N., Pradhan A., Hughes N., Gussy M. Access to dental services for children with intellectual and developmental disabilities—A scoping review. *Res Dev Disabil*; 74, 1-13. 2018.
27. Tesini D.A. An annotated review of the literature of dental caries and periodontal disease in mentally retarded individuals. *Spec Care Dentist*; 1 (2): 75-87. 1981.
28. Batista L.R.V., Moreira E.A.M., Rauen M.S., Corso A.C.T., Fiates G.M.R. Oral health and nutritional status of semi-institutionalized persons with mental retardation in Brazil. *Res Dev Disabil*; 30 (5): 839-846. 2009.
29. Liu Z., Yu D., Luo W., et al. Impact of oral health behaviors on dental caries in children with intellectual disabilities in Guangzhou, China. *Int J Environ Res Public Health*; 11(10):11015-11027. 2014.
30. Hashizume L.N., Schwertner C., Moreira M.J.S., Coitinho A.S., Faccini L.S. Salivary secretory IgA concentration and dental caries in children with Down syndrome. *Spec Care Dentist*; 37 (3): 115-119. 2017.
31. Zink A.G., Molina E.C., Diniz M.B., Santos M.T.B.R., Guaré R.O. Communication application for use during the first dental visit for children and adolescents with autism spectrum disorders. *Pediatr Dent*; 40 (1): 18-22. 2018
32. Aggarwal V.P., Mathur A., Dileep C., Batra M., Makkar D.K. Impact of sociodemographic attributes and dental caries on quality of life of intellectual disabled children using ECOHIS. *Int J Health C Sci*; 10 (4): 480. 2016
33. Faulks D., Hennequin M. Evaluation of a long term oral health program by carers of children and adults with intellectual disabilities. *Spec Care Dentist*; 20 (5):199-208. 2000.
34. Chapman D.A., Scott K.G., Stanton-Chapman T.L. Public health approach to the study of mental retardation. *Am J Ment Retard*; 113 (2):102-116. 2008.
35. Szatko F., Wierzbicka M., Dybizbanska E., Struzycka I., Iwanicka-Frankowska E. Oral

- health of Polish three-year-olds and mothers' oral health-related knowledge. *Community Dent Health*; 21 (2): 175-180. 2004.
36. Pani S.C., Mubarak S.A., Ahmed Y.T., AlTurki R.Y., Almahfouz S.F. Parental perceptions of the oral health related quality of life of autistic children in Saudi Arabia. *Spec Care Dentist*; 33 (1):8-12. 2013.
 37. Goettems M.L., Ardenghi T.M., Romano A.R., Demarco F.F., Torriani D.D. Influence of maternal dental anxiety on oral health-related quality of life of preschool children. *Qual Life Res*; 20 (6), 951-959. 2011.
 38. Abanto J., Carvalho T.S., Mendes F.M., Wanderley M.T., Bönecker M., Raggio D.P. Impact of oral diseases and disorders on oral health related quality of life of preschool children. *Community Dent Health*; 39 (2):105-114. 2011.
 39. Gogoi R.R., Kumar R., Deuri S.P. Anxiety, depression, and quality of life in mothers of children with intellectual disability. *Open J Psychiatry Allied Sci*; 8 (1): 71-75. 2017.
 40. MacGiollaPhadraig C., Guerin S., Nunn J. Train the trainer? A randomized controlled trial of a multi tiered oral health education programme in community based residential services for adults with intellectual disability. *Community Dent Oral Epidemiol*; 41 (2): 182-192. 2013.
 41. Chapman D. A., Scott K. G., Stanton-Chapman T. L. Public health approach to the study of mental retardation. *Am J Ment Retard*; 113 (2): 102-116. 2008.
 42. Lima Vazquez F., Cortellazzi K.L., Kaieda A.K., et al. Quality of life and socio-dental impact among underprivileged Brazilian adolescents. *Qual Life Res*; 24 (3): 661-669. 2015.
 43. Mc C.G., Bedi R. Gender variations in the social impact of oral health. *J Ir Dent Assoc*; 46 (3): 87-91. 2000.
 44. Prasanna J. S., Karunakar P., Sravya M.N., Madhavi B., Manasa A. Detrimental consequences of women life cycle on the oral cavity. *J Oral Res Rev*; 10 (1): 39. 2018.
 45. Chung M., Raman G., Chew P., Magula N., Trikalinos T., Lau J. Breastfeeding and maternal and infant health outcomes in developed countries. *Evid Technol Asses*; 153 (153): 1-186. 2007.
 46. Romero C.C., Scavone-Junior H., Garib D.G., Cotrim-Ferreira F.A., Ferreira R.I. Breastfeeding and non-nutritive sucking patterns related to the prevalence of anterior open bite in primary dentition. *J Appl Oral Sci*; 19 (2): 161-168. 2011.
 47. Sanches M.T.C. Manejo clínico das disfunções orais na amamentação. *Jornal de Pediatria*; 80:155-162. 2004.
 48. Scharfe E. Maternal attachment representations and initiation and duration of breastfeeding. *J Hum Lact*; 28 (2): 218-225. 2012.
 49. Rigo L., Dalazen J., Garbin R.R. Impacto da orientação odontológica para mães durante a gestação em relação à saúde bucal dos filhos. *Einstein (Sao Paulo)*; 14 (2): 219-225. 2016.



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