

The psychosocial effects of severe caries in 4-year-old children in Recife, Pernambuco, Brazil

As repercussões psicossociais da cárie severa em crianças aos quatro anos de idade em Recife, Pernambuco, Brasil

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Abstract

The aim of this study was to analyze the psychosocial effects of severe caries in 4-year-old children in Recife, Pernambuco, Brazil. The clinical examination was conducted by a single examiner in order to select children with severe caries and caries-free ($\kappa = 1$). Of the 861 children examined, 77 (8.1%) had severe caries and 225 (23.6%) were caries-free. Data were collected by applying validated questionnaires answered by the parents or guardians. Most of the parents or guardians of children with severe caries reported that their children complained of toothache (72.7%), and a significant portion stated that their children had problems eating certain kinds of food (49.4%) and missed school (26.0%) because of their teeth. Most of the parents or guardians of children with severe caries (68.8%) stated that oral health affects their children's life, while the same was stated by 9.8% of the parents or guardians of the caries-free children. Severe caries was found to have a negative impact on children's oral health-related quality of life.

Quality of Life; Oral Health; Preschool Child

Introduction

Despite the decline in the incidence of dental caries in many countries, the condition remains a significant problem for poor children. The prevalence of caries varies greatly in both developed and underdeveloped countries and among socioeconomic groups in developed countries ¹.

Children from low socioeconomic status communities have worse dental health than their more privileged counterparts. Children living at or below the poverty line experience a higher average number of untreated carious primary and permanent teeth than do children living above it ².

Rampant caries represents a particularly severe form of the disease, affecting smooth surfaces of maxillary anterior teeth of young children ³. Children with severe caries usually require the extraction of several and, on occasion, of all deciduous teeth. Children who require multiple extractions before the age of six may be suffering from undetected malnutrition ⁴.

Manifestations of early childhood caries may go beyond pain and infection. Although pain and infection may be the primary effects of early childhood caries, the condition may also affect the child's general health. In the study carried out by Acs et al. ⁵ children with early childhood caries weighed significantly less than their matched controls.

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Oral disease is a universal problem, but it is often a low priority for health policy-makers because it is rarely life-threatening. However oral disease can have a significant impact on both the social and the psychological aspects of an individual's life. Oral health problems can affect an individual's quality of life by impairing physical and social functioning, as well as their self-esteem ⁶.

The study of oral health status has been firmly grounded in the measurement of tissue pathology, characterized by the use of numerous clinical indicators with minimal attention paid to the impact of this pathology on social and psychological functioning ⁷. Thus, the kind of preventive dentistry that concentrates only on the child's oral health is inadequate. Rather, attention must be focused on the whole family, its dental health habits, and lifestyles ⁸.

Dental caries may have an impact on children's oral health status throughout their lives. Children who experience early childhood caries tend to experience caries later in both primary and permanent dentition ⁹.

Severe caries affects the quality of life of preschool children. Preschool children with dental disease do not necessarily complain of pain; however, they do manifest the effects of pain in their altered eating and sleep habits ⁹.

Quality of life can be broadly defined in terms of adequate resources, fulfillment of social roles in multiple life domains, satisfaction with life in various domains, and general life satisfaction ¹⁰.

Measures that address oral health-related quality of life are being used with increasing frequency in oral health surveys. The latter document the functional and psychosocial outcomes of oral disorders and are intended to supplement clinical indicators in order to provide a comprehensive account of the health of individuals and populations ¹¹.

Caries prevalence remains high for some groups of children in Brazil. The dental treatment needs of poor preschool Brazilian children are very great; research carried out by Rosenblatt ¹² revealed that 46.2% of the children from low-income families, aged from 25 to 36 months, in the city of Recife, presented early childhood caries at different levels of severity.

The purpose of this study was thus to determine the impact of severe caries in preschool children by investigating its psychosocial effects, comparing an affected group of children with a caries-free group.

Methods

This study was carried out in Recife, the capital of Pernambuco, in the Northeast of Brazil. The municipality has a total area of 220 km² and a population in 2000 of 1,346,045 (Instituto Brasileiro de Geografia e Estatística. *Censo Demográfico 2000*. <http://www.ibge.gov.br>, accessed on 23/Jun/2002). In accordance with data supplied by the Department of Education of Recife, the city has a total of 144 schools run by the municipality and is divided into 6 administrative regions (AR). In 2002, these schools catered for 5,093 children from the age of four living in the district where their school is situated, as well as children from neighboring districts.

The calculation of the sample was made using the Epi-Info Version 6.0 statistical program for microcomputers with a 95% confidence interval and error no greater than 2%, using a level of 0.5 for statistical significance and considering 8% to be the prevalence of severe caries in 4-year-old children, in accordance with the pilot study. Thus a sample size of 707 children was obtained, but in order to minimize representative losses that would compromise the final outcome of the study an extra 20.0% of children was added. The final sample therefore consisted of 861 children. A sample of such primary units (schools) was selected and all members of the population associated with the selected units were included in the sample (single-stage sampling). The schools were randomly selected in proportion to the number of schools in each area.

The children's oral health was evaluated on the basis of a clinical examination. The clinical examination was conducted by a single examiner in order to select children with severe caries (Group A) and caries-free children (Group B) (intra-examiner kappa = 1). The oral clinical examination took place at the child's school in accordance with the criteria established by the Brazilian Ministry of Health (Programa Nacional de Doenças Transmissíveis. *AIDS e Herpes na Prática Odontológica*. Brasília: Ministério da Saúde; 1994). The clinical examination was only visual, using a disposable spatula and a handheld light, and was conducted in the classroom in artificial light.

The children were healthy and free from physical or mental handicaps. For inclusion in the severe caries group the children had to have, at the minimum, cavitation on any surface of

two maxillary incisors, one maxillary first molar, and one mandibular molar. Thus we expected both an aesthetic and functional impairment of the child's oral health. These criteria were based on the "severe" stage of early childhood caries, according to the classification by Babeely et al.¹³ According to these authors, the nursing-bottle syndrome is classified as mild if the child has caries on the facial or lingual surface of at least one of the primary maxillary incisors and, optionally, on the primary maxillary first molars, moderate if the buccal surface of one or both of the primary mandibular first molars are also involved, and severe if specific multiple surfaces are involved.

The data were collected in 2002, from February to June, by applying validated interviewer-administered questionnaires (Figure 1) answered by the parents or guardians. The information relating to the children's oral health

was obtained by means of questions, which, in part, draw on the questionnaire by Jokovic et al.¹¹, the P-CPQ, which is a measure of parental-caregiver perceptions of the oral health-related quality of life of children.

In order to elicit the children's perception of their own teeth, they were asked "How do you feel when you think about your teeth?", after which the researcher showed Figure 2, extracted from the *Autoquestionnaire Qualité de Vie Enfant Image* (AUQEI)¹⁴, to help the children express their feelings (sad or happy).

The pilot study, which was conducted with 101 children (11.7% of the total sample), set out to perform the validation of the instruments and calibration of the researcher, in addition to making possible any adjustments required to ensure the smooth progress of the study. The questionnaires answered by the parents or guardians were validated by face validity.

Figure 1

Questionnaire.

Data on the child

Name: _____ Sex: () male () female

Parent or guardian

1- Who are you in relation to the child?

() mother () father () grandmother () other: _____

2- What's your level of education?

() illiterate () primary education () secondary education () higher education

Socioeconomic characteristics

3- How many people live in your home? _____

4- What's your family income? _____

Child's oral health

5- Has your child ever had toothache?

() yes () no

6- Has your child ever missed school because of his/her teeth (pain, appointments)?

() yes () no

7- Do you think that your child feels embarrassed about smiling because of his/her teeth?

() yes () no

8- Does your child have difficulty eating certain kinds of food (hot, cool, sweet)?

() yes () no

9- Does your child like to play with other children?

() yes () no

10- Has he/she stopped playing with other children because of his/her teeth?

() yes () no

11- How much is your child's overall well-being affected by the condition of his/her oral health?

() not at all () very little () some () a lot

The data from the present study was processed with the variables duly categorized using Microsoft Excel 97, typed in by a single person. All statistical analyses were done with SPSS version 11 and SAS version 8, and an a priori level for acceptance of statistical significance was set at $p \leq 0.05$. The chi-square test was calculated to check for any association between the two groups. Fisher's exact test was applied when the frequencies were small. Odds ratios (OR) were calculated for significant associations.

The parents or guardians were previously informed about the purposes and methods of this study and their informed consent was obtained. The study design was approved by the Institutional Review Board/Research Ethics Committee of the Federal University in Pernambuco, Brazil (Protocol n. E024/02).

Results

Of all the children examined, 449 (52.1%) were boys and 412 (47.9%) were girls; 77 (8.1%) had severe caries (Group A) and 225 (23.6%) were caries-free (Group B).

For most of the sample, the child's parent or guardian was the mother (63.2%), had completed elementary education (71.5%), and had a monthly income of approximately \$80.00 (59.3%), which represents the national minimum wage at the time of the study.

Most of the parents or guardians of children with severe caries reported that their children complained of toothache, and a significant portion stated that their children had problems eating certain foods, were absent from school, were ashamed to smile, and stopped playing with other children because of their teeth (Table 1).

Most of the parents or guardians interviewed stated that oral health affects their children's life, while the opposite was stated by the parents or guardians of the caries-free children (Table 2).

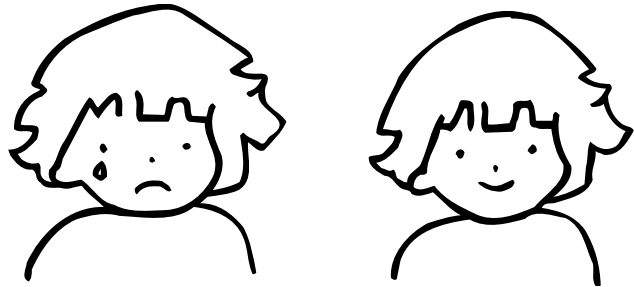
The children from Group A stated more frequently they felt sad, as compared to the caries-free children. The OR values indicate that the probability of children feeling sad about their teeth is higher among children with severe caries (Table 3).

Discussion

According to some authors^{4,5,6,9}, most parents or guardians of children with severe caries stated that oral health affects their children's life.

Figure 2

Faces of Autoquestionnaire *Qualité de Vie Enfant* Image 14.



They reported that their children complained of toothache, had problems eating certain foods, were absent from school, were ashamed to smile, and stopped playing with other children because of their teeth.

The majority (72.7%) of the parents or guardians of children with severe caries reported that their children suffered from toothache. Acs et al.⁵ stated that pain and infection may be the primary effects of nursing caries. Pain may be associated with other factors related to the severity of the disease, such as altered eating patterns and/or sleep habits and absence from school; 26.0% of the parents or guardians of children with severe caries mentioned this latter factor.

Some parents or guardians of the Group B children (7.1%) also reported that their children suffered from toothache. Considering that these children were caries-free, it is possible that the pain reported was related to primary teeth eruption or exfoliation.

A significant percentage of parents or guardians of children with severe caries (49.4%) reported that their children had problems eating certain foods, which is in accordance with Low et al.⁹, who stated that preschool children with dental disease manifest the effects of pain in their altered eating and sleep habits. The difficulties in eating certain foods also corroborates the suggestion by Miller et al.⁴, who pointed out that children with severe caries, who usually require multiple extractions, may be suffering from undetected malnutrition. In addition, Acs et al.⁵ observed that children with nursing caries weighed significantly less than their matched controls.

Children with severe caries stated more frequently that they felt sad about their teeth,

Table 1

Distribution of children by group according to the question.

Question	Group				Total		p value
	A (severe caries)		B (caries-free)		n	%	
	n	%	n	%			
Toothache							p < 0.001
Yes	56	72.7	16	7.1	72	23.8	
No	21	27.3	209	92.9	230	76.2	
Absence from school							p < 0.001
Yes	20	26.0	8	3.6	28	9.3	
No	57	74.0	217	96.4	274	90.7	
Ashamed to smile							p < 0.001
Yes	24	31.2	2	0.9	26	8.6	
No	53	68.8	223	99.1	276	91.4	
Problems eating certain foods							p < 0.001
Yes	38	49.4	12	5.3	50	16.6	
No	39	50.6	213	94.7	252	83.4	
Stopped playing with other children							p < 0.001
Yes	7	9.1	–	–	7	2.3	
No	70	90.1	225	100.0	295	97.7	

Table 2

Guardian or parent's perception of the effect of oral health on their children's life by group.

Guardian or parent's perception	Group				Total		p value
	A (severe caries)		B (caries-free)		n	%	
	n	%	n	%			
Not at all	24	31.2	203	90.2	227	75.2	p < 0.001
Very little	9	11.7	5	2.2	14	4.6	
Some	17	22.1	6	2.7	23	7.6	
A lot	27	35.1	11	4.9	38	12.6	
Total	77	100.0	225	100.0	302	100.0	

Table 3

Children's perception of their teeth.

Perception	Group				Total		p value	OR and CI with 95%
	A (severe caries)		B (caries-free)		n	%		
	n	%	n	%				
Sad	26	33.8	49	21.8	75	24.8	p = 0.036	1.83 (1.04-3.23)
Happy	51	66.2	176	78.2	227	75.2		
Total	77	100.0	225	100.0	302	100.0		

when compared to the caries-free children. In addition, parents or guardians of children with caries reported that their children were ashamed to smile because of their teeth (31.2%), while some (9.1%) stopped playing with other children for the same reason. Chen & Hunter⁶ stated that oral health problems can affect an individual's quality of life by impairing social functioning and self-esteem.

The cluster effect was not considered in the sample size calculation, which is, admittedly, a study limitation. Nevertheless, although a sample of 707 children was estimated, the final

sample consisted of 861 children because an additional 20.0% of children were added in case of losses, which in fact did not occur.

The results of this study could be important in defining public health policy priorities in poor areas where the levels of severe caries are high. Children with severe caries complained of toothache, had problems eating certain foods, were absent from school, were ashamed to smile, and stopped playing with other children because of their teeth. Thus severe caries was found to have a negative impact on children's oral health-related quality of life.

Resumo

O objetivo desse estudo foi analisar as repercussões psicossociais da cárie severa em crianças aos quatro anos de idade na cidade de Recife, Pernambuco, Brasil. O exame clínico foi realizado por uma examinadora, com o objetivo de selecionar crianças com cárie severa e livres de cárie ($\kappa = 1$). Das 861 crianças examinadas, 77 (8,1%) eram portadoras de cárie severa e 225 (23,6%) eram livres de cárie. Os dados foram coletados por meio da aplicação de questionários validados, respondidos pelos responsáveis. Verificou-se que a maioria dos responsáveis pelas crianças portadoras de cárie severa relatou que suas crianças reclamavam de dor de dente (72,7%); uma parcela significativa afirmou que as crianças tiveram problemas para comer certos alimentos (49,4%) e faltaram às aulas (26,0%) por causa dos dentes. A maioria dos responsáveis pelas crianças portadoras de cárie severa (68,8%) relatou que a saúde oral das crianças afetava a vida delas em geral, enquanto o mesmo foi relatado por 9,8% dos pais ou responsáveis pelas crianças livres de cárie. Concluiu-se que a cárie severa teve um impacto negativo na qualidade de vida relacionada à saúde.

Qualidade de Vida; Saúde Bucal; Pré-Escolar

Contributors

S. Feitosa participated in the data collection and analysis and drafting of the article. V. Colares contributed to the data analysis and drafting and revision of the final text. J. Pinkham collaborated in the drafting and revision of the final text.

References

1. Reisine S, Douglass JM. Psychosocial and behavioral issues in early childhood caries. *Community Dent Oral Epidemiol* 1998; 26:32-44.
2. Gillcrist JA, Brumley DE, Blackford JU. Community socioeconomic status and children's dental health. *J Am Dent Assoc* 2001; 132:216-22.
3. Dini EL, Holt RD, Bedi R. Caries and its association with infant feeding and oral health-related behaviors in 3-4-year-old Brazilian Children. *Community Dent Oral Epidemiol* 2000; 28:241-8.
4. Miller J, Vaughan-Williams E, Furlong R, Harrison L. Dental caries and children's weights. *J Epidemiol Community Health* 1982; 36:49-52.
5. Acs G, Lodolini G, Kaminsky S, Cisneros GJ. Effect of nursing caries on body weight in a pediatric population. *Pediatr Dent* 1992; 12:302-5.
6. Chen MS, Hunter P. Oral health and quality of life in New Zealand: a social perspective. *Soc Sci Med* 1996; 43:1213-22.
7. Reisine S, Fertig J, Weber J, Leder S. Impact of dental conditions on patient's quality of life. *Community Dent Oral Epidemiol* 1989; 17:7-10.
8. Matilla ML, Rautava P, Silanpaa M, Paunio P. Caries in five-year-old children and associations with family-related factors. *J Dent Res* 2000; 79: 875-81.
9. Low W, Tan S, Schwartz S. The effect of severe caries on the quality of life in young children. *Pediatr Dent* 1999; 21:325-6.
10. Lehman AF. The effects of psychiatric symptoms on quality of life assessments among the chronic mentally ill. *Eval Program Plann* 1983; 6:143-51.
11. Jokovic A, Locker D, Stephens M, Kenny D, Tompson B. Validity and reliability of a questionnaire for measuring child oral health-related quality of life. *J Dent Res* 2002; 81:459-63.
12. Rosenblatt A. Clínica odontopediátrica – uma abordagem preventiva. Recife: EDUPE; 1998.
13. Babeely K, Kaste LM, Husain J, Behbehani J, Al-Za'abi F, Maher TC, et al. Severity of nursing-bottle syndrome and feeding patterns in Kuwait. *Community Dent Oral Epidemiol* 1989; 17:237-9.
14. Magnificat S, Dazord A. Évaluation de la qualité de vie de l'enfant: validation d'un questionnaire, premiers résultats. *Neuropsychiatr Enfance Adolesc* 1997; 45:106-14.

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