

Early childhood caries, family functioning, and common mental disorders in a region of Belo Horizonte, Brazil

Queila Cunha Ferreira Heckert¹  | Natália Natielle Carvalho Golini¹  | Renata Castro Martins¹ 
Efigênia Ferreira Ferreira¹ 

¹School of Dentistry, Universidade Federal de Minas Gerais, Belo Horizonte, Minas Gerais, Brazil

Aim: This cross-sectional study aimed to analyze the need for dental treatment in preschool children concerning early childhood caries (ECC), evaluated by the School Health Program (SHP); family functioning; and common mental disorders (CMDs) within families in Belo Horizonte, Minas Gerais, Brazil.

Methods: A structured questionnaire was applied to the main caretaker of the 61 children by telephone contact. The questions addressed socioeconomic and demographic data; the Questionnaire of General Family Functioning (GFF) sought to investigate family functioning; and the Self-Reporting Questionnaire (SRQ-20) served to screen for CMDs among the main caretakers. Secondary data were collected from the SHP to survey the need for oral health treatments. The dependent variable was the need for tooth restoration or extraction. The data were analyzed descriptively and by Pearson's chi-square and Fisher's exact tests ($p < 0.05$), using SPSS v.22.0.

Results: The median age of the children was 5 years old, and 32.8% required treatment for dental caries. There was no association between the need for tooth restoration or extraction and socioeconomic factors, family relations, and the presence of CMDs in the main caretaker ($p > 0.05$). However, there was a greater frequency of need for treatment in families with low income (24.6%) and with less social support (family and friends < 1). Children whose family was included in the Family Grant Program (62.3%), the respondent was the mother (57.4%), had completed high school or higher (36.1%), no paid work (42.6%), with a traditional or nuclear family structure (27.8%), and living in a house with good sanitary conditions (63.9%) presented a lower frequency of need for treatment. The GFF and SRQ-20 values among preschool children with and without the need for dental treatment were similar.

Conclusion: There was a trend of a higher need for ECC treatment in children from families with lower income and less familiar and social support.

Uniterms: Dental Caries. Preschool Children. Family Relations. Mental Health.

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INTRODUCTION

Early childhood caries (ECC) has increased in many countries and become a major public health problem, especially in socially disadvantaged populations^{1,2}. ECC is classified as the presence of carious lesions, loss, or restoration in at least one deciduous tooth in

children under six years of age, impacting the child's quality of life³. This impact on one's quality of life among children with dental caries, aged 2 to 5 years, is nearly 3-fold when compared with those without dental caries⁴. Factors predisposing to ECC include a low level of education and unemployment of the caretaker, the mother being a smoker, eating habits with a greater intake of

Corresponding author:

Renata Castro Martins

Avenida Presidente Antônio Carlos, 6627, Pampulha, Belo Horizonte, Minas Gerais. Phone: +55 31 3409 2474. CEP: 31270-901

E-mail: rcmartins05@gmail.com

sugar, difficult access to oral health care, and ruptures in the family and culture⁵.

One factor that can mediate the relationship between social conditions, behavior, and childhood health is the family environment. Parents' psychosocial factors that negatively affect the child's oral health include the mother's depression, a low sense of family coherence, permissive parenting, and parental stress⁶. Family environments with favorable health attitudes contribute to the prevention of dental caries, while those who do not present good health attitudes tend to have children with higher indices of dental caries⁷.

Family functioning refers to the assessment of the interactions among the members of the family within the household and not only the individual characteristics of its members. Family functioning is associated with many components of childhood development and physical and mental health outcomes⁶. The mother's capacity to take care of her child is a protective factor that would lessen the impact of an unfavorable environment, in which the child is more vulnerable. Preschool children who live in low-income areas and whose mothers present common mental disorders (CMDs) have a high risk of developing early caries lesions⁸. There is a close relationship between the adequacy of the mother as a caretaker with her level of education, physical state, mental health, time availability, social support, autonomy, and financial resources⁷.

Faced with the inequality of the distribution of caries and the disease burden concentrated in preschool children, it is important to clarify the role of the diverse risk factors and the reasons that lead some children to have more caries than others^{9,10}. In this light, the present study seeks to assess the need for ECC dental treatment, considering socioeconomic factors, family relations, and the presence of CMDs in the main caretaker.

MATERIALS AND METHODS

This study was approved by the Research Ethics Committee of Universidade Federal de Minas Gerais (UFMG) (CAAE: 40313020.5.0000.5149) and by the Municipal Health Secretariat of the City Hall of Belo Horizonte (CAAE: 40313020.5.3001.5140).

This is a cross-sectional, descriptive study carried out in Belo Horizonte, Brazil, within the scope of a Health Center. The study included the families of preschool children evaluated by the School Health Program (SHP). This scope was

chosen for convenience and because this unit is located between the two largest populations of preschool children evaluated by the SHP in 2019.

For data collection, a secondary SHP databank was used. The exclusion criteria were records duplicated and presented incomplete data related to the proper coding indicating the need for oral health treatment.

The collected variables were: the child's age (years), sex (female or male), inclusion of the family in the Family Grant Program (yes or no), and the need for oral health treatment.

The survey of oral health needs, conducted by the SHP, in the preschool children, is coded from 00 to 3, according to the number of untreated caries lesions¹¹; code 00: absence of caries; code 0: dental elements without cavities and need for tooth restoration or extraction; code 1: presence of up to 03 teeth with cavitated teeth needing restoration or extraction; code 2: presence of 04 to 08 cavitated teeth with the need for restoration or extraction; code 3: 09 or more cavitated teeth with the need for restoration or extraction. The dependent variable was categorized as absence (codes 0 and 00) or presence (codes 1 to 3) for the need for tooth restoration or extraction.

A structured questionnaire, applied by phone contact, to the main caretaker of the preschool children, was used for primary data collection. The data collection took place in the first half of 2021, during the COVID-19 pandemic. Information was collected regarding the socioeconomic data of the family household, such as age (years), relation to the child (mother and others - father, grandmother, grandfather, uncle, aunt), education (incomplete high school, complete high school, or higher), and paid work (yes - at home, out of home, no - homemaker, or unemployed) of the main caretaker. Family data, such as family structure (traditional, single parent, second marriage or remarried, substitute family, binuclear family, homosexual parents, and extended family), total family income (\leq R\$ 1,000.00, $>$ R\$ 1,000.00); sanitation conditions (good or bad); and social support from parents and friends, categorized by the median.

The questionnaires of General Family Functioning (GFF) sought to investigate family functioning¹², while the Self-Reporting Questionnaire (SRQ-20) for the screening of CMDs was also applied.

The GFF is a subscale of 12 items originally formulated with 53 items, called the General Functioning Scale of the McMaster Family Assessment Device¹² and was validated

in Brazilian Portuguese by Pires et al.¹³. This instrument contains questions about the structure and organization of the family unit and the relationship patterns among the family members and is based on six dimensions: problem-solving, communication, family roles, affective responsiveness, affective involvement, and behavioral control. The answers present five categories (“fully agree”, “agree”, “neither agree nor disagree”, “disagree”, and “fully disagree”), scored with values of 1 to 5 (Likert scale), respectively. To reach the final score, the even question scores were inverted, followed by the sum of and division by the same number of questions¹². The final score of the GFF can vary between 0 and 5.00, with 0 representing the worst family functioning and 5.00 representing the best family functioning¹³. This variable was dichotomized by the median (≤ 3 , > 3).

The SRQ-20 is an instrument proposed by the World Health Organization (WHO) to screen cases suspected of CMDs in the study population validated for the Brazilian population by Gonçalves et al.¹⁴. It consists of 20 questions with dichotomous answers – yes/no – about psychosomatic symptoms used to track non-psychotic disorders. The participant is considered exposed when he/she answers affirmatively to eight or more questions¹⁵.

One pilot study was conducted with 20 main caretakers of preschool children, where it was possible to observe a good understanding of the questionnaires. Those who participated in the pilot study did not participate in the main study.

The data were analyzed descriptively, using the IBM Statistical Package for the Social Sciences (SPSS), version 22.0 (IBM SPSS Statistics for Windows, Armonk, NY, USA). The quantitative data were submitted to the Kolmogorov-Smirnov test ($p < 0.05$). Those that presented a symmetric distribution were identified through mean and standard deviations.

Those that presented an asymmetric distribution were identified through medians and percentiles. Pearson’s chi-square and Fisher’s exact tests were used to estimate associations between the dependent and independent variables, considering a 95% confidence level ($p < 0.05$).

RESULTS

Initially, this databank had 211 student records; however, 112 of the records were excluded due to duplication and 16 presented incomplete data related to the proper coding indicating the need for oral health treatment, leaving 83 eligible student records.

Of the 83 student records included in this study, 18 families were not contacted due to a lack of a phone number, and 4 refused to participate in the study. In total, 61 questionnaires were applied.

The median age of the preschool student participants was 5 years ($P_{25} = 3.00$; $P_{50} = 5.00$; $P_{75} = 5.00$). Most of the children were male (62.3%), belonged to a family household included in the Family Grant Program (91.8%), and presented no need for tooth restoration or extraction (67.2%). The caretakers presented a mean age of 35 years (± 7.8). Most of the participants were mothers (88.5%), had completed high school education or higher (52.5%), and had no paid work (62.3%). In relation to the family structure, the better part of the families had a single-parent format (34.4%), with an income $< R\$1,000.00$ (62.3%), and reported good sanitary conditions (96.7%) (Table 1).

Most of the families reported minimal social support from the family (70.5%) and friends (73.8%). The GFF scores found in this study presented a median = 3.00 ($P_{25} = 2.75$; $P_{75} = 3.87$). In this sense, the majority of the families presented lower family functioning (55.7%), but showed no exposure to CMDs (54.1%) (Table 1).

Table 1. Absolute and relative frequencies of the socioeconomic characterization of the evaluated children and their families. Belo Horizonte, Minas Gerais, 2021.

(continues)

Variables	Absolute frequency	Relative frequency
Sex of the child	n	%
Female	23	37.7
Male	38	62.3
Family Grant Program		
Yes	56	91.8
No	5	8.2

Need for treatment		
No need	41	67.2
Need	20	32.8
Relation to the child		
Mother	54	88.5
Other (father, grandmother, aunt)	7	11.5
Level of Education		
Up to incomplete high school	29	47.5
Complete high school or more	32	52.5
Paid work		
Yes	23	37.7
No	38	62.3
Family structure		
Traditional or nuclear	19	31.1
Single parent	21	34.4
Second marriage or remarriage	4	6.6
Substitute	2	3.3
Extended	15	24.6
Income*		
≤ 1,000.00 reais	38	62.3
> 1,000.00 reais or more	23	37.7
Sanitary conditions		
Good	59	96.7
Bad	2	3.3
Family social support		
1	43	70.5
2 or more	18	29.5
Friends' social support		
1	45	73.8
2 or more	16	26.2
Family functioning (median)		
≤ 3	34	55.7
>3	27	44.3
Common mental disorder		
Exposed	33	54.1
Not exposed	28	45.9

*\$1 Brazilian real = \$0.1920 USD (July 2021)

There was no association between the need for tooth restoration or extraction and socioeconomic factors, family relations, and the presence of CMDs in the main caretaker ($p > 0.05$). However, it was observed that children whose family was included in the Family Grant Program (62.3%), the respondent was the mother (57.4%) and had completed high school or higher (36.1%), whose main caretaker had no

paid work (42.6%), with a traditional or nuclear family structure (27.8%), living in a house with good sanitary conditions (63.9%) presented a major frequency of absence of the need tooth restoration or extraction. On the other hand, children whose family's income was up to 1,000.00 reais (24.6%) and smaller familiar (23.0%) and social support (24.6%) presented a need for tooth restoration or extraction (Table 2).

Table 2. Absolute and relative frequencies of the crossing of variables with the presence or absence of the need for ECC treatment, Belo Horizonte, Minas Gerais, 2021.

Variables	Need for tooth restoration or extraction				p value
	Absence		Presence		
	n	%	n	%	
Family Grant Program					
Yes	38	62.3	18	29.5	0.534**
No	3	4.9	2	3.3	
Relation to the child					
Mother	35	57.4	19	31.2	0.258**
Other (father, grandmother, aunt)	6	9.8	1	1.6	
Level of Education					
Up to incomplete high school	19	31.1	10	16.4	0.788*
Complete high school or higher	22	36.1	10	16.4	
Paid work					
Yes	15	24.6	8	13.1	
No	26	42.6	12	19.7	0.796*
Family structure					
Traditional or nuclear	17	27.9	2	3.3	0.155**
Single Parent	13	21.3	8	13.1	
Second marriage or remarried	2	3.3	2	3.3	
Substituted	1	1.6	1	1.6	
Extended	8	13.1	7	11.5	
Income*					
Up to 1,000.00 reais	23	37.7	15	24.6	0.153*
1001.00 reais or more	18	29.5	5	8.2	
Sanitary conditions					
Good	39	63.9	20	32.8	0.448**
Bad	2	3.3	0	0.0	
Family social support (median)					
1	29	47.5	14	23.0	0.953*
2 ore more	12	19.7	6	9.8	
Friends' social support (median)					
1	30	49.2	15	24.6	0.879*
2 or more	11	18.0	5	8.2	
Family functioning					
≤ 3	24	39.3	10	16.4	0.529*
> 3	17	27.9	10	16.4	
Common mental disorder					
Exposed	19	31.1	9	14.8	0.921*
Not exposed	22	36.1	11	18.0	

*\$1Brazilian real = \$0.1920 USD (July 2021)

Pearson's chi-square test

** Fisher's exact test

DISCUSSION

In this study, the frequency of preschool students who did not need tooth restorations or extractions was high. These results are similar to

other studies conducted with preschool children in Brazil, with a prevalence of children free of dental caries of 47.7%⁷ and 67.1%¹⁶. By contrast, one study of the estimation of the prevalence of ECC of 193 participating UN countries found a

mean prevalence of ECC of 23.8% in children under 36 months of age and 57.3% in children from 36 to 71 months. Untreated caries lesions in small children continue to be a health problem in many countries¹⁷.

A higher frequency of the need for ECC treatment occurred in children whose families had a lower income and less family and friends' social support. Preschool children who lived in traditional or nuclear families, whose families were registered in the Family Grant Program, lived in a place with good basic sanitation, and the main caretaker had a higher level of education, showed less need for dental treatments. The evidence is that social support to the caretaker is associated with positive outcomes in oral health, especially when related to social capital¹⁸⁻²⁰. However, there are studies that demonstrate an inverse relation between social support and the frequency of access to oral health services and healthy oral health behaviors^{21,22}. The influences of the families on the occurrence of early dental caries in children depend on the socioeconomic conditions and the family structure²³. The fact that the mother is married or lives with a partner is a protective factor that diminishes the rate of progression of child caries, whereas when the child lives alone with his/her mother or father in a non-nuclear home, there is a higher risk of child caries²⁴. A lower frequency of the need for dental treatments was observed in children whose caretakers had no paid work. In the present study, caretakers without paid work were those who were homemakers, or unemployed. One possible explanation for this finding could be that these people spend more time at home and this is reflected in the care of the children.

There was no major difference in the frequency of GFF of preschool children with or without the need for ECC dental treatment. The study conducted by Silva and Katz²⁵ showed similar results. However, one study conducted among high-income Chinese children found a significant association between the family functioning measured by the GFF and by the ECC, in which the majority of the children from poor-functioning families presented a worse situation of oral health than did children from families with good family functioning²⁶.

The family structure has also been associated with ECC, suggesting that the family structure should be considered in the development of oral health promotion programs⁹. Family environments with a high level of conflict have been associated with the worst outcomes in oral health²⁷. In addition, the affective and

communication restrictions can play an indirect role in behavioral problems and dental caries experience in children²⁸.

In the population of the present study, a frequency of 45.9% was found for the positive screening for CMD. The prevalence of CMD found in studies in Brazil has varied from 17% to 35%²⁹⁻³¹. The population of the present study most likely suffered the impacts of the COVID-19 pandemic on their mental health, which led to a greater frequency of CMDs and their symptoms³². It is important to remember that the COVID-19 pandemic also had a disproportionate impact on populations with greater economic inequality and less access to preventive health care^{33,34}.

Although little difference was found in the frequency of the SRQ-20 of the caretakers of preschool children with and without the need for dental treatment in relation to caries, it is important to consider that the result found in this study may well have been impacted by the fact that it was conducted during the COVID-19 pandemic. The maternal CMDs have been associated with dental caries in their children, and the more significant the symptoms of maternal CMD, the more severe the dental caries condition in children³⁵.

The limitations of this study include the use of secondary data from SHP databanks. There was a considerable loss in the sample due to the duplication of children's records in this databank, along with missing information. Probably no association was observed due to the small sample size. This fact limits the generalization of the results outside of the studied sample, but it points to the need for studies with larger and longitudinal samples, seeking to clarify the effect of the COVID-19 pandemic, and the association between family functioning and maternal CMD, and the development of dental caries in preschool children.

CONCLUSION

There was a trend, within this population, of a higher need for ECC treatment in children from families with lower income and less familiar and social support.

AUTHOR'S CONTRIBUTION

QCFH: Contributed to the to the conception, acquisition, analysis and interpretation of data, wrote the work and approved the final version to be published.

NNCG: Contributed to the edition and revision of

the manuscript and approved the final version to be published.


RCM: Contributed to the design of the study, analysis and interpretation of the data; participated in the critical revision of the work to obtain important intellectual contents and approved the final version to be published.


EFF: Contributed to the conception and design of the study and interpretation of the data; participated in the critical revision of the work to obtain important intellectual contents and approved the final version to be published.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

ORCID

Queila Cunha Ferreira Heckert  <https://orcid.org/0000-0003-0534-5043>

Natália Natielle Carvalho Golini  <https://orcid.org/0000-0002-4180-6284>

Renata Castro Martins  <https://orcid.org/0000-0002-8911-0040>

Efigênia Ferreira Ferreira  <https://orcid.org/0000-0002-0665-211X>

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Cárie da Primeira Infância, funcionamento familiar e transtornos mentais comuns: realidade em uma região de Belo Horizonte, MG

Objetivo: Este estudo transversal teve como objetivo analisar a necessidade de tratamento odontológico em pré-escolares em relação a cárie da primeira infância (CPI), avaliados pelo Programa Saúde na Escola (PSE), o funcionamento familiar e transtornos mentais comuns em suas famílias, em Belo Horizonte, Minas Gerais. Brasil.

Métodos: Um questionário estruturado foi aplicado ao principal cuidador das crianças avaliadas pelo PSE, por meio de contato telefônico (n = 61). As questões abordaram dados socioeconômico, demográficos, o Questionário de Funcionamento Geral Familiar (FGF), para investigação do funcionamento familiar e o *Self-Reporting Questionnaire* (SRQ-20) para triagem de transtornos mentais comuns no principal cuidador. Dados secundários foram coletados nos registros do banco de dados do PSE, para levantamento da necessidade de tratamento em saúde bucal. A variável dependente foi a necessidade de restauração ou extração dentária. Os dados foram analisados descritivamente e pelos Testes de Qui-quadrado de Pearson e Exato de Fisher ($p < 0,05$), usando o SPSS. v. 22.0.

Resultados: A mediana de idade das crianças foi de 5 anos e 32,8% tinha necessidade de tratamento em relação à cárie dentária. Não houve associação entre a necessidade de restauração ou extração dentária e fatores socioeconômicos, relações familiares e a presença de transtornos mentais no cuidador principal ($p > 0,05$). Entretanto, houve maior frequência de necessidade de tratamento de CPI em famílias com baixa renda (24,6%) e com menor apoio social (família e amigos < 1). As crianças cujas famílias estavam incluídas no Programa Bolsa Família (62,3%), o entrevistado era a mãe (57,4%), tinha ensino médio completo ou superior (36,1%), não exercia atividade remunerada (42,6%), tinha estrutura familiar tradicional ou nuclear (27,8%) e morava em uma casa com boas condições sanitárias (63,9%) apresentaram menor frequência de necessidade de tratamento. Os valores do GFF e do SRQ-20 entre crianças pré-escolares com e sem necessidade de tratamento odontológico foram semelhantes.

Conclusão: Observou-se maior frequência de necessidade de tratamento de CPI em crianças de famílias com menores renda e apoio social.

Descritores: Cárie Dentária. Pré-Escolar. Relações Familiares. Saúde Mental.