ORIGINAL RESEARCH
Social/Community Dentistry

Contextual and individual determinants of oral health-related quality of life among adolescents

Ana Paula Milagres Alfenas SILVA[a]
Jessica Klockner KNORST[b]
Julia Rodrigues ANDRADE[a]
Rafaela Silveira PINTO[c]
Renata Castro MARTINS[c]
Amália MORENO[d]
Fabiana VARGAS-FERREIRA[c]

[a]Universidade Federal de Minas Gerais – UFMG, School of Dentistry, Department of Community and Preventive Dentistry, Belo Horizonte, MG, Brazil.

[b]Universidade Federal de Santa Maria – UFSM, School of Dentistry, Department of Stomatology, Santa Maria, RS, Brazil.

[c]Universidade Federal de Minas Gerais – UFMG, School of Dentistry, Department of Community and Preventive Dentistry, Belo Horizonte, MG, Brazil.

[d]Universidade Federal de Minas Gerais – UFMG, School of Dentistry, Department of Dentistry, Belo Horizonte, MG, Brazil.

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Corresponding Author:
Fabiana Vargas-Ferreira
E-mail: fabivfer@gmail.com

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Abstract:

Gini coeffcient, illiteracy, unemployment, income, average number

Keywords:

Introduction

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model used the fxed-effects scheme with a random

of variables (in which contextual variables in fuence

adjusted models. In all models, the goodness of ft

and social aspects (working,ful flling a social role, and fnding satisfaction in social gatherings and physical

Results

white (59.6%) and had a lower household income (≤

(HDI), Gini coeffcient, illiteracy, unemployment,

prevalence of oral impacts (OIDP ≥ 1) was 31.8%

All the analyses were performed using the Complex Samples module to account for the complex sampling design of the of the Minas Gerais Oral Health Study. Stata 16 (StataCorp.2014 Stata Statistical Software: Release 16.1. College Station, TX, StataCorp LP) was used for data analysis.

Table 1. Description of independent variables according to the level of analysis involving adolescents (n = 1,202), SB Minas Gerais, Brazil, 2012.

Variables	Description
Level 1 – Individual	
Sex	Male-female
Household income	Up to R$1,500 (Brazilian currency) (≤2BMW) *More than R$1,500 (>2 BMW)
Skin color	Self-reported skin color; a dichotomous variable was created from five original categories (white or non-white).
Age (years)	15–16 / 17–18
Maternal education (years)	Dichotomous: < 8 or ≥ 8
Number of people per room	Quantitative
Prevalence of untreated dental caries	Dichotomous: presence or absence
Gingival bleeding	Dichotomous: presence or absence
Self-perception of dental need	No need (healthy crown and root)
	One surface restoration
	Two or more surface restorations
	Prosthetic crown needed for any reason
	Dental facet
	Pulp treatment and restoration
	Tooth extraction
	White spot treatment
	Sealant
Dental attendance	Dichotomous: regular user or non-regular user
Level 2 – Local	
HDI	Human Development Index
Domain	State capital, Inland towns I, Inland towns II
Gini coefficient	Income or wealth distribution
Illiteracy	Percentage (%) of individuals who cannot read or write and have no language proficiency in the total resident population in the minimum age range in a geographic space within the considered year
Unemployment	Percentage (%) of economically active individuals unemployed during the reference week in a geographic space within the considered year
Half the BMMW	Percentage (%) of residents with monthly family income per capita up to half the Brazilian monthly minimum wage in a geographic space within the considered year
Oral health team coverage	Percentage (%) of population covered by Oral Health Teams
Primary health care coverage	Percentage (%) of the population covered by Primary Health Care teams
Supervised toothbrushing	Percentage (%) of collective actions of supervised toothbrushing
Rate of tooth extractions between selected dental procedures	Percentage (%) of extractions between all the dental procedures carried out
Sanitary sewage	Percentage (%) of residents with access to drinking water, sewage collection and treatment
Garbage collection	Percentage of residents with access to garbage collection system
Number of emergency dental visits per inhabitant	Average number of emergency dental visits per inhabitant in a given location and period

*$ Brazilian Real = $ 0.50 USD (Jul 2012); BMMW: Brazilian monthly minimum wage.

Figure. Conceptual model for assessing factors that affect the outcome.[22]

Table 2. Descriptive analysis of individual variables for the sample of adolescents (n = 1,202), Minas Gerais, Brazil, 2012.

Individual-level variables	n (%
Sex	
Male	533 (44.7)
Female	669 (55.3)
Age (years)	
15	294 (24.5)
16	252 (21.0)
17	224 (18.6)
18	248 (20.6)
19	184 (15.3)
Skin color	
White	469 (40.4)
Non-white	733 (59.6)
Maternal education	
> 8 years of formal education	941 (78.4)
≤ 8 years of formal education	260 (21.6)
Household income	
> 2 BMW	402 (42.3)
< 2 BMW	742 (57.7)
	mean (SD)
Household crowding	4.50 (1.59)
Dental attendance 8	n (%)*
Regular user	618 (51.6)
Non-regular user	578 (48.4)
Self-perception of dental needs	
No	619 (53.4)
Yes	583 (46.6)
Untreated dental caries*	
No	694 (60.2)
Yes	506 (39.8)
Gingival bleeding	
No	814 (66.2)
Yes	388 (33.8)
	mean (SD)
OIDP	
OIDP extent	0.72 (0.05)
	n (%)
Prevalence (OIDP ≥ 1)	382 (30.8)
Eating	89 (7.4)
Speaking	48 (4.0)
Cleaning teeth	133 (11.0)
Sleeping	89 (7.4)
Smiling	115 (9.6)
Emotional well-being	148 (12.1)
Social role	46 (3.8)
Social contact	68 (5.7)
Doing sports	3 (3.1)

Continue

Continuation

*Missing values for some variables; **Sampling design taken into account.

Table 3. Unadjusted association between contextual and individual variables and overall OIDP scores, determined by multilevel Poisson regression .

Variables	RR (95%CI)	p-value
Contextual-level variables		
Gini coefficient	1.50 (0.01–112.96)	0.854
HDI	0.83 (0.02–24.13)	0.913
Unemployed	1.01 (0.94–1.10)	0.735
Illiteracy	0.99 (0.97–1.02)	0.906
Family income per person	0.99 (0.99–1.00)	0.793
Primary healthcare coverage	0.99 (0.98–1.00)	0.108
Oral health team coverage	0.99 (0.99–1.00)	0.378
Supervised toothbrushing	0.96 (0.91–1.00)	0.102
Gross Domestic Product	0.99 (0.99–1.00)	0.138
Allocation factor	0.59 (0.21–1.62)	0.305
Number of emergency dental visits per inhabitant	1.08 (1.02–1.16)	0.011
Sanitary sewer	0.99 (0.99–1.00)	0.711
Garbage collection	1.00 (0.99–1.02)	0.241
Number of tooth extractions between selected dental procedures	1.03 (0.99–1.07)	0.096
Individual-level variables		
Sex		
Male	1.00	< 0.001
Female	1.41 (1.22–1.63)	
Age (years)		0.329
15	1.00	
16	1.21 (0.99–1.49)	0.059
17	1.20 (0.98–1.49)	0.080
18	1.03 (0.83–1.28)	0.749
19	1.10 (0.87–1.39)	0.404
Skin color		
White	1.00	< 0.001
Non-white	1.36 (1.17–1.59)	
Maternal education		
[3] 8 years of formal education	1.00	< 0.001
< 8 years of forma education	1.97 (1.66–2.35)	
Household income in R$		
< 2 BMW	1.00	< 0.001
> 2 BMW	0.57 (0.48–0.68)	
Number of people per room	1.11 (1.06–1.15)	< 0.001
Dental attendance		
Regular user	1.00	0.137
Non-regular user	1.11 (0.97–1.28)	

Continue

Continuation		
Self-perception of dental needs		< 0.001
No	1.00	
Yes	2.27 (1.96–2.64)	
Untreated dental caries		
No	1.00	< 0.001
Yes	2.25 (1.95–2.61)	
Gingival bleeding		
No	1.00	< 0.001
Yes	1.56 (1.32–1.84)	

RR: rate ratio; CI: confidence interval; BMW: Brazilian minimum wage (1BMW corresponds to approximately US$200).

The findings of the adjusted multilevel Poisson

(RR = 1.25; 95%CI 1.06–1.49) influenced the OIDP

Discussion

The present findings show that poor contextual

household crowding. Generally, the influence of the

Table 4. Adjusted association between contextual and individual variables and overall OIDP scores, determined by multilevel Poisson regression

Variables	Model 1[a]	Model 2[b]	Model 3[c]
	"empty"	"contextual"	"full"
	RR (95%CI)	RR (95%CI)	RR (95%CI)
Fixed component			
Intercept	0.57 (0.46–0.70)	1.18 (0.58–2.39)	0.25 (0.13–0.45)
Contextual-level variables			
Gini coefficient	–	–	
HDI	–	–	
Unemployed	–	–	
Illiteracy	–	–	
Family income per person	–	–	
Primary healthcare coverage	–	–	
Oral health team coverage	–	–	
Supervised toothbrushing	–	0.95 (0.91–0.99)	0.95 (0.91–0.99)
Gross Domestic Product	–	0.99 (0.99–1.00)	0.99 (0.99–1.00)
Allocation factor	–		
Number of emergency dental visits per inhabitant	–	1.07 (1.01–1.13)	1.08 (1.01–1.14)
Sanitary sewer	–	–	
Garbage collection	–	–	
Number of tooth extractions between selected dental procedures	–	1.02 (0.98–1.05)	1.00 (0.97–1.05)
Individual-level variables			
Sex			
Male			1.00
Female			1.29 (1.12–1.50)
Age (years)			
15			
16			
17			
18			
19			
Skin color			
White			1.00
Non-white			1.17 (0.99–1.38)
Maternal education			
≥ 8 years of formal education			1.00
< 8 years of forma education			1.55 (1.29–1.87)
Household income in R$			
≤ 2 BMW			1.00
> 2 BMW			0.66 (0.55–0.79)

Continue

household income may reflect the accumulation of knowledge, which influences the adoption of healthy

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