RELATIONSHIP BETWEEN DEPRESSION, ALCOHOL AND /OR TOBACCO ABUSE OF THOSE RESPONSIBLE AND CHILDREN'S ORAL HEALTH

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Palavras-chave: Saúde Bucal. Depressão. Alcoolismo. Tabagismo.

RESUMO

Objetivo: Investigar a influência da depressão parental e do uso de cigarro e álcool pelos pelos pais/cuidadores na saúde bucal de crianças de 5 a 11 anos de ambos os sexos. **Métodos**: Um estudo do tipo transversal foi conduzido com 85 crianças e seus respectivos cuidadores. Para detectar a presença de depressão, duas versões do PHQ (Pacient Health Questionnaire) foram aplicadas: o PHQ-2, contendo duas perguntas com opção de resposta afirmativa ou negativa e o segundo, PHQ-9. Para o uso de álcool foi aplicado o AUDIT (Alcohol Use Disorders Identification Test) para avaliação do risco de dependência e abuso de álcool; e o Fagerstrom para dependência de nicotina. As crianças foram submetidas a exames orais para avaliação do controle de biofilme, sangramento gengival e presença de cárie (índices CPO-D e ceo-d). Para verificar a associação entre as diferentes variáveis, foram utilizados os testes Qui-quadrado e Exato de Fisher. **Resultados**: Somente 10,6% dos responsáveis faziam uso de tabaco e 24,7% dos mesmos apresentavam sintomas de depressão. Em relação ao consumo de álcool, 10,6% apresentavam consumo de risco ou dependência. Verificou-se associação entre sangramento gengival nas crianças e o risco de dependência de álcool dos responsáveis (p=0,038). **Conclusão**: Concluiu-se que há uma associação positiva entre o risco de dependência de álcool dos responsáveis e a presença de sangramento gengival no paciente e que a depressão, o uso de álcool e de tabaco pelos cuidadores não influência na experiência de cárie das crianças.

Keywords: Oral Health. Depression. Alcoholism. Tobacco.

ABSTRACT

Objective : To investigate the influence of parental depression and smoking and alcohol use by parents/caregivers use on oral health in children aged 5-11 years of both sexes. **Methods**: A cross-sectional study was conducted involving 85 children and their parents/caregivers. Adult respondents completed three questionnaires to assess depression and alcohol and tobacco use: two versions of the PHQ (Patient Health Questionnaire; PHQ-2 and PHQ-9), AUDIT (Alcohol Use Disorders Identification Test) for risk assessment of alcohol dependence and abuse, and the Fagerström Test for Nicotine Dependence (FTND). The PHQ-2 contained two questions requiring an affirmative or negative answer. Children underwent oral examinations to evaluate biofilm control, gingival bleeding and caries index, specifically DMFT index. Relationships among variables were evaluated using chi-squared tests and Fisher's exact test. **Results**: Only 10.6% of parents and caregivers consumed tobacco and 24,7% of parents or caregivers manifested depressive symptoms. Regarding alcohol consumption, 10.6% of caregivers presented risky consumption or dependence. A positive association was found between children's gingival bleeding and their caregivers' risk of alcohol dependence (p=0.038). **Conclusion**: A positive association between caregivers' risk of alcohol dependence and the presence of gingival bleeding in children was found. Caregivers' depression and alcohol and tobacco use did not influence children's caries.

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INTRODUCTION

Dental caries is deemed a complex, polymicrobial disease. It can also be considered as a dysbiosis. Dental caries lesions are only observed when there is an imbalance in the environment that favors the acidification of the dental biofilm. Caries occur as a result of the metabolism of dietary carbohydratesw by living microorganisms.[1]

In the last national sampling performed in 2010, Brazil presented a DMF-T (Decayed, Missing, Filled Teeth) caries rate of 2.1 in children aged 12 years. This number is 25% lower than the one reported in 2003 (DMF-T caries rate of 2.78). However, the index of decayed primary teeth did not decrease substantially and the number of untreated teeth remained high (80%).[2]

Worldwide, caries is still one of the most common chronic diseases among children[3] and its cause has been mainly attributed to factors such as poor oral hygiene and a high-sugar diet. Nonetheless, secondary factors, such as level of education, parents' occupations and socioeconomic level, are recognized as important determinants of children's health.[4] In this context, the family plays a major role in developing healthy habits in their children, for instance, teaching about proper oral health. The adult directly responsible for the child should teach about oral hygiene.

The most common psychiatric disorders are mood disorders. These include depression, bipolar disorders, anxiety disorders and chemical dependencies, most notably alcoholism.[5] Several factors may explain psychiatric disorders, such as genetics or biochemical issues, as well as a person's lifestyle.[5] According to Vidal *et al*. (2013)[6], mental disorders are more prevalent in females, individuals with little education or low income, smokers, and women who suffered violence. Some evidence suggests that mothers' ability to care for their children is negatively impacted when their mental health is affected.[7] Research shows that mothers with depressive symptoms offer less effective emotional support and provide limited assistance with their child's education, regardless of age group.[7,8]

Only a few known studies[9-12] examine the influence of parents' psychosocial problems on the oral health of their children. Thus, to increase understanding of this topic, the main purpose of the present study is to identify possible relationships between parents' or caregivers' depression, smoking, and alcohol use and the oral health of children.

MATERIALS AND METHODS

This study was approved by the Research Ethics Committee of the Federal University of Rio de Janeiro, Rio de Janeiro, Brazil, by the CAAE number 68963517.8.0000.5257 and the ethics approval number 2.328.197. Before starting this study, informed consent was obtained from parents and a formal agreement from children/adolescents.

This research can be considered a pilot study, as no other research directly relates parents' or caregivers' psychiatric disorders and alcohol and tobacco consumption to the oral health of children without disabilities.

An observational cross-sectional study was conducted with a non-probabilistic sample, selected by convenience including all those who attended an appointment during one semester and agreed to participated. The final sample consisted of 85 children and adolescents aged 5-11 years of both sexes and their primary caregivers. Participants were patients at the Pediatric Dentistry Clinic in the Department of Pediatric Dentistry and Orthodontics at the Faculty of Dentistry of the Federal University of Rio de Janeiro, Brazil. Children went to the clinic accompanied by their parents or legal guardians in the period between March and August 2019. Children with negative behavior towards the clinical examination, children wearing orthodontic appliances, and guardians who did not agree to participate were excluded from this study.

Dependent variables were children's oral biofilm, gingival condition and dental caries. Predictors were adults' depression and use of alcohol/tobacco.

Instruments and Data Collection

PHASE I: Assessment of parental/caregiver depression and alcohol/tobacco use

To assess the presence of depression symptoms, parents/caregivers completed the PHQ (Patient Health Questionnaire) in its two versions (PHQ-2 and PHQ-9)[9-11] in face-to-face interviews. First, the PHQ-2 was used as a screening test for all parents. Subsequentially, those who answered "yes" to at least one question completed the PHQ-9 questionnaire. The PHQ-9 contains 9 items. Each item is scored from 0 to 3, resulting in a maximum score of 27. A score from 0 to 9 indicates the absence of depression, a score of 10 to 14 is considered mild depression, a score from 15 to 19 indicates moderate depression, and scores from 20 to 27 indicate severe depression. The two questionnaires were validated for the Brazilian population.[13-15]

Afterwards, all parents/caregivers completed the Brazilian version of the Alcohol Use Identification Test (AUDIT)[16] to assess alcohol consumption and risk of dependency. The questionnaire included 10 questions concerning the previous 12 months. Possible scores range from 0 to 40. Scores from 0 to 7 indicate low risk or moderate consumption, scores from 8 to 15 indicate risky consumption, and scores from 16 to 19 indicate harmful use or high consumption. Scores of 20 or more indicate a likely dependency.

Lastly, parents/caregivers completed the Fagerström Test for Addiction of Nicotine (FTND)[17,18] to detect dependence on this substance. The FTND has a six-item scale and produces scores ranging from 0 to 10. The score of nicotine addiction is divided into five levels: very low (0-2 points); low (3-4 points); moderate (5 points); high (6-7 points); and very high (8-10 points).

PHASE II: Children's clinical examination

Before the intra-oral clinical examination, a calibration procedure was undertaken in 10 patients (who were not included in the study population) by a single examiner previously trained and calibrated. The intra-examiner kappa concordance test was performed for the clinical parameters of biofilm index, gingival condition, and caries index, revealing values ≥ 0.75.

To evaluate their oral condition, all patients were examined using a mirror, explorer, gauze and periodontal probe under artificial light after previous prophylaxis. The criteria described below were used for the biofilm, gingival condition and caries index.

The quality and quantity of biofilm visible on the surfaces of the teeth were evaluated according to the biofilm index proposed by Ribeiro *et al*.[19] Biofilm was classified as thin when it could only be identified after drying the dental surface. Thick biofilm was firmly adhered to the dental surface and was easily identified upon visual examination. To classify the biofilm's resistance to removal, a single side scrub movement (from distal to mesial or vice versa) was performed with gauze. Children who scored 0 were considered to have an excellent biofilm control, while index scores of 1 and 2 were considered satisfactory and indicated a thin and easily removed biofilm (immature). Scores of 3, 4 and 5 represented poor mechanical control and indicated the presence of a thick and firmly adhered (mature) biofilm.

To assess the gingival condition, the bleeding index proposed by Aimano and Bay (1975)[20] was adopted. The periodontal probe was gently inserted in the gingival sulcus, covering the buccal and the palatal surfaces. In the case of spontaneous bleeding or bleeding after the probing, the score was 1. In the case of lack of bleeding, the score was 0.

Statistical analysis

The index recommended by the World Health Organization (WHO, 1997)[3], from which one can infer DMF-T for a permanent dentition and dmf-t for a primary dentition, was used in the dental examination to evaluate children's experience of dental caries. The data were organized and analyzed using the Statistical Package for the Social Sciences (SPSS for Windows, version 20.0; IBM Corp., Armonk, NY). A descriptive and univariate statistical analysis was performed to characterize the sample using the chi-squared test for nominal variables and the Student *t*-test for quantitative variables. A 95% confidence interval was used for the chi-squared test and Fisher's exact test. Significance level was set at $p<0.05$.

RESULTS

The sample included 85 pairs of legal guardians and child patients. The average age of patients was 8 years ± 3.07, with a minimum age of 5 and a maximum of 11; 60% of patients were male and 40% were female. Children's main caregivers were their parents (83.5%). The average age of caregivers was 42 years ± 11.22, with a minimum age of 31 and a maximum of 53. The majority of parents and caregivers (65.9%) had completed high school (Table 1).

Regarding the presence of depression, 24.7% of parents or caregivers manifested depressive symptoms. Mild levels of depression (15.3%) were most frequent. With regard to alcohol consumption, the majority (89.4%) had low risk or abstinence, while 10.6% presented risky consumption or dependence. Only 10.6% of parents and caregivers consumed tobacco. The majority (5.9%) consumed a very low amount of tobacco (Table 2).

The results of the bivariate analysis (Table 3) showed that gingival bleeding was higher in children whose parents or caregivers consumed alcohol (p=0.038). No statistically significant association was found between depression or tobacco consumption and children's oral health.

Table 1: Sample distribution, according to sociodemographic characteristics.

Children and adolescents (n = 85)		
Variables	**N**	**%**
Gender		
Female	34	40.0
Male	51	60.0
Age, (in years)		
≤ 8	40	47.1
> 8	45	52.9
Caretakers (n = 85)		
Age, (in years)		
≤ 42	51	60.0
> 42	34	40.0
Type of legal guardians		
Parents	71	83.5
Others	14	16.5
Educational level		
Illiterate	1	1.2
Primary education	20	23.5
Secondary education	56	65.9
Higher education	8	9.4

Table 2: Sample distribution (n = 85), according to psychological characteristics and substance use (alcohol and/or tobacco).

Depression		
Variables analyzed	**N**	**%**
Yes	21	24.7
Mild	13	15.3
Moderate	4	4.7
Severe	4	4.7
No	64	75.3
Alcohol consumption		
Low-risk or no-risk	76	89.4
Risky consumption or dependency	9	10.6
Tobacco consumption		
Yes	9	10.6
Very low	5	5.9
Low	2	2.4
High	2	2.4
No	76	89.4

Table 3: Association between depression, risky alcohol and tobacco use and the children's oral health (85 patients)

		Biofilm control %(n)		*p*-value*	Gingival bleeding* % (n)		*p*-value*	dmf-t	*p*-value**	DMFT	*p*-value**	Caries experience% (n)		*p*-value*	DMFT=0		*p*-value*
		Excellent/ satisfactory	Poor		Yes	No		Average (DP)		Average (DP)		Yes	No		Yes	No	
Depression	**Yes (n =21)**	76.2(16)	23.8(5)	0.50	2.8(5)	76.2(16)	0.50	2.85 (1.90)	0.22	0.75(1,33)	0.97	71.4(15)	50(19)	0.11	70(14)	73.5(25)	0.78
	No (n =64)	82.8(53)	17.2(11)		17.2(11)	82.8(53)		1.86(2.74)		0.74(1.40)		28.6(6)	50(19)		30(6)	23.5(9)	
Alcohol consumption	**Low-risk or norisk**	82.9(63)	17.1(13)	0.23	15.8(12)	84.2(64)	0.03	2.04(2.63)	0.81	0.72(1.38)	0.73	51(26)	66.7(6)	0.31	69.6(32)	66.7(6)	0.57
	Risky consumption or dependency (n=9)	66.7(6)	33.3(3)		44.4(4)	55.6(5)		2.29(2.62)		0.89(1.45)		49(25)	33.3(3)		30.4(14)	33.3(3)	
Tobacco consumption	**Yes (n=9)**	77.8(7)	22.2(2)	0.78	33.3(3)	66.7(6)	0.23	2.0(2.00)	0.94	0.89 (1.76)	0.73	66.7(6)	33.3(3)	0.41	77.8(7)	22.2(2)	0.49
	No (n=76)	81.6(62)	18.4(14)		17.1(13)	82.9(63)		2.07(2.69)		0.72(1.33)	56.3(43)		43.4(33)		70.6(48)	29.4(20)	

*Note: *Qui-square or Fisher test; ** Student t-test.*

DISCUSSION

Caries is still one of the most common chronic diseases among children,[3] and its cause has been mainly attributed to factors such as poor oral hygiene and a high- sugar diet. However, no other study has considered psychiatric disorders such as depression and substance use (tobacco and/or alcohol) in caregivers as possible contributing factors to children's poor oral health.

Recent studies have found a correlation between depression in mothers and caries in children without disabilities.[10,21] In this study, we did not observe a significant association between depression in caregivers and caries in patients. This may be because previous studies took place in the field, while our sample was comprised of regular patients of the pediatric dental clinic, who received specialized dental care according to their individual needs. Although this study found no statistical relationship, unlike the most recent studies, our results were equivalent to those found in a previous study conducted with special children[11] at the same institution. This suggests that the location of the research may influence the results.

This study found a significant positive association between alcohol consumption by legal caregivers and gingival bleeding rate in children. This association needs a careful interpretation because the study sample was small, and other systemic factors, such as oral hygiene habits, may have influenced the results; therefore, this result could be spurious. However, Gesser *et al*.[22] associated gingival bleeding with socioeconomic variables, such as place of residence and parents' educational level. In spite of the difference between the samples of Gesser *et al*.[22] and this one, participants answered the same questions in the initial questionnaire. Further, it was observed that legal caregivers who presented a risk of alcohol dependence lived mostly in high-risk areas, with one exception, and the majority had some secondary education, though may not have completed it. These factors could explain the high level of gingival bleeding in the children of these caregivers.

Leroy *et al*.[12] found a positive association between parents who smoked and caries experience in preschool children. These children were under 5 years of age and only had deciduous teeth. This result is not compatible with the one found in this study, since we did not observe a significant association between the tobacco use by caregivers and caries disease in patients. In the study of Garate *et al*.[11], conducted at the same institution with special patients, a positive association was found between use of tobacco by legal guardians and caries in children's primary teeth. In the present study, the age range was greater than the one used by Leroy *et al*.[12] study and the majority of the patients already had some or nearly all of their permanent teeth, which might also explain the difference in the results. The deciduous teeth have a thinner glaze that is less mineralized, and are thus more susceptible to caries disease.[23]

One limitation of this study is the small sample size. Additionally, radiographs were not taken. Therefore, proximal caries was probably not identified. In order to be considered as caries, the teeth should have been cavitated to eliminate active white spots. A further limitation was that biomarkers were not used to confirm the diagnosis of caregivers based on the questionnaires. The use of questionnaires can result in classification errors, in this case because respondents may have been ashamed of admitting their depression or use of alcohol and tobacco. Additionally, these data cannot be extrapolated to all children. These results should also be considered preliminary because the children represent a biased sample (obtained from the Dental School) and a convenience selection of volunteers. These limitations highlight the need to undertake longitudinal studies using larger samples to further evaluate the current data.

The results of this preliminary study suggests that it is important to recognize these changes in those caregivers and that in some way the child's oral health can be harmed by this. So, the management of the patient should include welcoming and direct guidance to parents who have similar conditions. Also, that epidemiological studies should be encouraged to verify the real association between these changes and their influence on children's oral health.

CONCLUSION

From the results of this study, the following conclusions were drawn:

1. There is a positive association between caregivers' alcohol consumption and gingival bleeding in children.

2. Depression and the consumption of alcohol and tobacco by caregivers does not influence children's caries experience.

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