Family risk as adjunct for organizing the demand for oral health service in the Family Health Strategy

Risco familiar como elemento para organização da demanda em saúde bucal na Estratégia Saúde da Família

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Resumo

Introdução: Um dos principais problemas dos serviços públicos de saúde, em que a equipe de saúde bucal da família está inserida, é o acesso dos usuários ao tratamento odontológico na atenção primária, principalmente no que se refere à doença cárie. **Objetivo**: O objetivo deste estudo foi avaliar a relação entre risco familiar – para priorização de visitas domiciliares – e condições de saúde bucal, visando a prover evidência sobre o primeiro indicador para organização da demanda em saúde bucal, na Estratégia Saúde da Família (ESF). **Método**: A verificação do risco familiar baseou-se na ficha A do SIAB, utilizada para o cadastramento das famílias na ESF. Onze cirurgiões dentistas examinaram as condições de saúde bucal de 1165 pessoas (608 de 12 a 19 anos e 557 de 35 a 44 anos de idade), classificando-as em seis códigos de A a F. Empregou-se a regressão logística multinomial (α=0,05) para análise da associação entre as variáveis de risco familiar e a situação de saúde bucal. **Resultado**: Houve associação significativa entre risco familiar e presença da doença cárie com necessidade de tratamento (OR: 2,08; p<0,0001). **Conclusão**: As pessoas que possuem risco familiar teriam duas vezes mais chance de apresentar a doença cárie em comparação às sem risco, corroborando a relevância deste elemento na organização da demanda em saúde bucal.

Descritores: Atenção primária à saúde; saúde bucal; risco; saúde da família.

Abstract

Introduction: One of the main problems of the public health services, in which the family oral health team is included, is access by users to dental treatment in primary care, with particular reference to caries disease. **Objective**: The aim of this study was to evaluate the relationship between family risk, for prioritization of home visits and oral health conditions, with a view to providing evidence about the first indicator for organizing the demand for oral health in the Family Health Strategy (FHS). **Method:** The application of family health is based on Form A of the primary care information database SIAB ("Sistema de Informação de Atenção Básica"), used for registering families with the FHS. Eleven dentists examined the oral health conditions of 1165 persons (608 from 12 to 19 years; and 557 from 35 to 44 years of age), classifying them into six codes from A to F. Multinomial logistic regression was used (α=0.05) to analyze the association between family risk variables and oral health situation. **Result**: There was significant association between family risk and presence of caries disease with treatment needs (OR: 2.08, p<0.0001). **Conclusion:** Persons who have family risk would have twice as much chance of presenting caries disease in comparison with those without risk, corroborating the relevance of this element in organizing the demand for oral health.

Descriptors: Primary health care; oral health; risk; family health.

INTRODUCTION

Although there has been an important reduction in dental caries over the last few decades, particularly in children of school-going age, and increase in its polarization, this disease is still shown to be a major cause of morbidity in oral health[1]. The data of SB 2010 showed that the prevalence of this disease in children at 12 years of age diminished from 2.8 (DMF-T) in 2003 to 2.1 in 2010[2]. Nevertheless, another important datum leads us to the results of the survey of oral health conditions in the Brazilian population in 2010, in which tooth-ache in the last six months was reported in 24.7% of adolescents and 27.5% of adults[3].

With a view to prevention of the outcomes in health, and especially, in the reduction in incidence of health problems, the Family Health Strategy (FHS) was presented as a model for restructuring primary care, by means of a set of actions conjugated in alignment with the principles of the Brazilian national health system " Sistema Único de Saúde" - SUS. This is guided from focal point of territorialization, hierarchization, integrality and registration of families with follow-up by a multidisciplinary team[4].

Due to the need for expansion of oral health actions to the Brazilian population, the Ministry Of Health, by means of Administrative Ruling MS 1444, of 28/12/2000, regulated by Administrative rulings 267 of 06/03/2001 and 1599 if 09/07/2011, established financial incentives for the inclusion of an oral health team in the Family Health Strategy, with the goal of reorganizing dental care provided in the municipalities[5-7].

One of the main problems of the public health services, in which the family oral heal team is included, is access by users to dental treatment in primary care, with particular reference to caries disease. Because of the high demand for this service, there is great difficulty in guaranteeing the universality and equity of the assisted population[8,9]. In the State and Municipality of São Paulo (Brazil), the technical secretaries of oral health have used risk classification criteria for caries disease with the intention of prioritizing and organizing the population's dental care in primary health care[10-12].

In order to organize health promotion and prevention actions within the Family Health Strategy, Coelho, Savassi[13] drew up a risk scale with the purpose of prioritizing the most vulnerable families in home visits. The scale was drawn up by means of the family registration chart (Form A of the Primary Case Information System - SIAB), filled out by the Community Health Agent (CHA) during the home visit[13].

Considering the basic principles of SUS, especially equity, the family risk is outstanding as an important element for organizing the demand on primary care. Therefore, the purpose of this study was to evaluate the relationship between family risk and oral conditions, with a view to providing subsidy for the development of actions to improve the organization of demand for oral health care in the Family Health Strategy.

METHOD

This study was developed in accordance with the norms and ethical precepts of Resolution CNS No. 196/96, and approved by the Research Ethics Commission of the Municipal Secretary of Health of São Paulo, by Report No. 96/2010.

The probabilistic sample was composed of 1165 persons, which provided a test power $(1-\beta)$ higher than 0.80, with a level of significance (α) of 0.05 for an *odds ratio* of 2.0, probability of response of 68% and probability of success of 75%, calculated according to Demidenko[14]. Therefore, 608 adolescents from 12 to 19 years and 557 adults from 35 to 44 years, of both genders, were summoned for dental treatment at the eleven Family Health Units, in the Eastern Zone of the Municipality of São Paulo (SP). In order to evaluate the similarity of the socioeconomic profile of persons who have access to these Family Health Units, the percentage of the population that does not have a health insurance plan (SUS-dependents), collected by means of the SIAB (primary care information system) database. The mean percentage of SUS-dependence in the eleven Family Health Units was 88.7% (86.2%-91.5%).

Clinical Exams

For inspectional evaluation of the oral health conditions, the dental caries risk classification recommended by the state and municipal health secretaries of São Paulo, standardized by Kobayashi et al.[11,12], was used (Chart 1). Firstly, training was conducted in a Family Health Unit, in order to evaluate the accuracy and reproducibility of this nominal tracing instrument. In this, eleven dentists belonging to eleven Family Health Units in the city of São Paulo independently examined 120 persons (75 from 12 to 19 years, and 45 from 35 to 44 years of age). After training, by means of the Kappa statistical test, intra-examiner (mean Kappa=0.7015) and inter-examiner analyses were performed in comparison with the gold standard examiner (mean Kappa = 0.7203), with the results being considered good and substantial, respectively[11,15]. In the calibrated examiners' units of origin, they performed family triage, using the caries risk classification as routine for organizing the demand. In each Family Health Unit, a mean number of 50 adolescent patients from 12 to year years and 50 adult patients from 35 to 44 years of age were examined. It should be remembered that all the patients agreed to

Chart 1. Codes and criteria of the dental caries risk classification

Dental Caries Risk Classification	
Code	**Criteria**
A	Absence of carious lesion, absence of restored teeth, absence of tooth loss and absence of large amounts of biofilm.
B	Absence of dental caries in activity, presence of restored tooth, absence of tooth loss, and absence of large amounts of biofilm.
C	Absence of dental caries in activity, presence of chronic dental caries, and temporary restorative material (IRM, ZOE or ionomer in permanent teeth), presence of tooth loss and absence of large amounts of biofilm
D	Presence of initial caries lesions without cavitation (white spot lesions in activity), and presence of large amounts of biofilm.
E	Presence of one or more dental caries cavities.
F	Presence of pain, abscess, fistula, visible pulp involvement and root fragments

participate in the research by means of signing the Term of Free and Informed Consent, and stating that they were under dental treatment through the local planning of each oral health team in the eleven Family Health Units.

Establishment of Family Risk

After performing the dental caries risk classification, the researcher in charge visited the eleven Family Health Units and analyzed the family health record chart together with Form A of SIAB, filled out by the CHA (Community Health Agent) during the home visit. With these documents, the family risk was attributed to each patient, using the scale of Coelho, Savassi[13] (Chart 2). The exclusion criteria were: non obtainment of the family record chart, Form A not filled out correctly, and change of residence.

Data Analysis

Where oral health is concerned (Chart 1), the codes A, B and C were grouped as the absence of disease/healthy, which comprises person with absence of caries lesions in activity, cavities exposed to the oral medium, and perceptibly visible dental biofilm. Code D remained as exposure to a biologic risk factor, and Codes E and F, grouped as dental treatment need/sick. Record charts in which family risk was identified were categorized by codes R1, R2 or R3 (Chart 2) and the patients were included in the group with family risk. However, those record charts that did not attain 5 points on

Chart 2. Family risk scale of Coelho, Savassi[13]

Data on Form A		Score
Bedridden		3
Physical disability		3
Mental deficiency		3
Low sanitation conditions		3
Malnutrition (Severe)		2
Drug addiction		2
Unemployment		1
Illiteracy		1
Children under six months of age		1
Person older than seventy years		1
Systemic arterial hypertension		1
Diabetes Mellitus		1
Resident/Room ratio	If greater than 1	3
	If equal to 1	2
	If less than 1	0
Total score	**Risk Classification**	
Score 5 or 6	R1	
Score 7 or 8	R2	
Score higher than 9	R3	

the scale presented in Chart 2, led to the respective patients being categorized in the group without family risk. Considering that Chart 1 indicates three outcome categories (healthy, at risk and sick), multinomial logistic regression analyses were performed with two marginal models (Sick vs. Health and Sick vs. Risk) for the explanatory variables observed (α=5%). It is pointed out that in this sample there were no bedridden patients or any with severe malnutrition. Subsequently, the joint effect of all the explanatory variables was tested in a multiple regression model, and only those with p < 0.05 remained. All the analyses were performed with the statistical R version 3.0.2(R Foundation for Statistical Computing, Vienna, Austria) software program.

RESULT

In the initial logistic regression model (Table 1), there was significant effect of the explanatory variables *age (years)*, *drug addiction*, *residence with persons of over 70 years of age*, *resident/room ratio* and effective presence of some *family risk*. Whereas, for the studied model, the multiple regression model (Table 2) showed significant effect of three variables in the comparison between sick and healthy individuals. Adult patients (35-44 years) would have 2.88 more chance of presenting caries disease in comparison with the adolescents (12-19 years). Analogously, residents with a resident/room ratio higher than 1 would be associated with significantly higher chances of the occurrence of dental caries disease (OR:1.45, p<0.0092). In terms of risk, delimited by the classification in Chart 2, persons who presented scores equal to or higher than 5 would have greater chances of being diagnosed as sick (OR:2.08, p<0.0001). The age-range was also significant in the comparison between sick individuals and those at risk of developing dental caries disease. Adults would have more chance of effectively being classified as sick in comparison with adolescents (OR:1.74, p=0.0250), who, in the majority of cases, would also be at risk of presenting caries disease.

DISCUSSION

The results of this study suggested that the family risk scale, drawn up by Coelho, Savassi[13], with its respective risk variables and due scores appears to be sensitive to oral disease that demands the majority of dental consultations in SUS; that is, dental caries; Cheachire et al.[16] were unable to relate the family risk scale to the situation of caries and periodontal diseases. The authors themselves suggested that the instrument should be re-evaluated with a larger and more heterogeneous sample of users, coming from distinct suburbs and social conditions, with a view to providing greater external validity of the results found[16]. With the present study, it was possible to fulfill these needs, by evaluating a sample considered satisfactory and representative of a distinct population, as 11 different Family Health Units were involved, with professionals previously trained for the epidemiological exam[11].

The dental caries risk classification was created with the intention of prioritizing and organizing the demand, by means of a triage (tracing) of patients who needed dental treatment[10-12]. With respect to the applicability of the instrument, this tool is easy

Table 1. Explanatory variables researched as regards oral health situation based on dental caries risk classification by means of multinomial logistic regression

Variable	Category	Total	%	Oral Health						Simple Multinomial Logistic Regression					
				Healthy		Risk		Sick		SickvsHealthy			SickvsRisk		
				n	%	n	%	n	%	OR	CI	p	OR	CI	p
Gender	Female	727	62.4	221	30.4	44	6.1	462	63.5	1.22	0.94-1.57	0.1376	1.22	0.75-1.99	0.4237
	Male	438	37.6	150	34.2	30	6.8	258	58.9	Ref.					
Age (years)	12-19	608	52.2	252	41.4	42	6.9	314	51.6	Ref.					
	35-44	557	47.8	119	21.4	32	5.7	406	72.9	2.74	2.10-3.56	<0.0001	1.70	1.05-2.75	0.0320
Physical Disability	No	1148	98.5	369	32.1	73	6.4	706	61.5	Ref.					
	Yes	17	1.5	2	11.8	1	5.9	14	82.4	3.66	0.83-16.21	0.0876	1.45	0.19-11.20	0.7230
Mental Deficiency	No	1145	98.3	369	32.2	71	6.2	705	61.6	Ref.					
	Yes	20	1.7	2	10.0	3	15.0	15	75.0	3.93	0.89-17.28	0.0705	0.50	0.14-1.78	0.2878
Low Sanitaion Conditions	No	1140	97.9	367	32.2	71	6.2	702	61.6	Ref.					
	Yes	25	2.1	4	16.0	3	12.0	18	72.0	2.35	0.79-7.01	0.1246	0.61	0.17-2.11	0.4328
Drug addicion	No	1132	97.2	366	32.3	74	6.5	692	61.1	Ref.					
	Yes	33	2.8	5	15.2	0	0.0	28	84.8	2.96	1.13-7.74	0.0268	-	-	-
Unemployment	No	1046	89.8	340	32.5	71	6.8	635	60.7	Ref.					
	Yes	119	10.2	31	26.1	3	2.5	85	71.4	1.47	0.95-2.26	0.0816	3.17	0.97-10.30	0.0552
Illiteracy	No	1149	98.6	367	31.9	73	6.4	709	61.7	Ref.					
	Yes	16	1.4	4	25.0	1	6.3	11	68.8	1.42	0.45-4.51	0.5481	1.13	0.14-8.92	0.9059
Children Under Six Months of age	No	1124	96.5	359	31.9	72	6.4	693	61.7	Ref.					
	Yes	41	3.5	12	29.3	2	4.9	27	65.9	1.17	0.58-2.33	0.6645	1.40	0.33-6.03	0.6494
Person Older Than Seventy Years	No	1117	95.9	362	32.4	72	6.4	683	61.1	Ref.					
	Yes	48	4.1	9	18.8	2	4.2	37	77.1	2.18	1.04-4.57	0.0392	1.95	0.46-8.27	0.3650
Systemic Arterial Hypertension	No	813	69.8	271	33.3	49	6.0	493	60.6	Ref.					
	Yes	352	30.2	100	28.4	25	7.1	227	64.5	1.25	0.94-1.65	0.1189	0.90	0.54-1.50	0.6918
Diabetes Mellitus	No	1066	91.5	348	32.6	67	6.3	651	61.1	Ref.					
	Yes	99	8.5	23	23.2	7	7.1	69	69.7	1.60	0.98-2.62	0.0589	1.01	0.45-2.30	0.9725
Resident/Room Ratio	≤1	471	40.4	175	37.2	30	6.4	266	56.5	Ref.					
	>1	694	59.6	196	28.2	44	6.3	454	65.4	1.52	1.18-1.96	0.0012	1.16	0.71-1.90	0.5432
Family Risk (R1 + R2 + R3)	No	907	77.9	321	35.4	58	6.4	528	58.2	Ref.					
	Yes	258	22.1	50	19.4	16	6.2	192	74.4	2.33	1.66-3.28	<0.0001	1.32	0.74-2.35	0.3500

Table 2. Multiple logistic regression model for analyzing joint effect of significant explanatory variables as regards oral health situation

Variable	Category	Multiple Multinomial Logistic Regression									
		Sick*vs*Healthy					Sick*vs*Risk				
		Estimate	Standard-Error	OR	CI	P	Estimate	Standard-Error	OR	CI	p
Age (years)	12 - 19	Ref.									
	35 - 44	1.06	0.14	2.88	2.20-3.78	<0.0001	0.55	0.25	1.74	1.07-2.83	0.0250
Resident/room Ratio	≤ 1	Ref.									
	> 1	0.37	0.14	1.45	1.10-1.91	0.0092	0.15	0.26	1.16	0.70-1.94	0.5600
Family Risk (R1 + R2 + R3)	No	Ref.									
	Yes	0.73	0.19	2.08	1.44-2.99	<0.0001	0.25	0.31	1.29	0.71-2.35	0.4100

to memorize and is indicated for use on a large scale; that is, for tracing the dental treatment needs of a large number of persons. Its application is rapid, low cost and uses few resources, because all it requires is a wooden spatula for the clinical exam. Grouping the population into three categories based on individual characteristics (apparently healthy, at risk and really sick), the oral health teams could organize their demand for care of a larger number of persons, mainly respecting the principle of equity, thus optimizing their equipment, and consequently improving the services in primary care[8-12]. The resources necessary for activities with each of the three groups could be more easily provided, and the scheduling of returns for re-evaluation determined with greater consistency.

Nevertheless, equity and integrality involve the evaluation of various factors related to a physical outcome. For this, analysis of the family risk with regard to dental caries disease is necessary. The results provided in Table 1 show that 22.1% of the individuals submitted to dental triage presented family risk (R1+R2+R3). This percentage was lower than that shown in the results of a study conducted in a Primary Health Care Unit (PHCU) in Espírito Santo (55.4%)[17] and above that of the example of family risk shown by the authors themselves (3.9%)[13]. The percentage obtained in this study is probably due to the evaluation of persons who sought the health service, because they presented some type of problem, which is a bias in researches conducted in health units. Another outstanding factor is that this study was developed with persons in the age-ranges of adolescents and young adults, consequently with greater morbidities and major risks for dental caries[3,8].

The oral health teams are included in the PCHUs together with the family health teams, and there may be from one oral health team to one family health team, up to one oral health team for more than two family health teams[10,12]. There is a spontaneous demand for emergency dental consultations and treatments. In addition, some oral health teams summon families for dental treatment by numerical order of the family registration, which apparently seems to be the easiest way of summoning people, however, it would not be fair to families with higher registration numbers[10,12]. Other teams find patients through the CHA, who perceives dental problems during his/her home visit, and reports them to the oral health team during meetings[18]. The central question is that only this

port of entry may overburden the CHA and lead to clientelism. In Fortaleza, an Community Oral Health Indicator (COHI) (Indicador Comunitário em Saúde Bucal - ICSB) was developed[19]. By means of a questionnaire, the CHA analyzes the oral health conditions of the population registered with the Family Health Program, and together with the oral health team, seeks to prioritize dental attendance[19].

The risk factors for caries disease among the members of a family may be associated with genetics and the environment, such as: similar constitution of the teeth and salivary composition, same dietary habits, same oral hygiene practices and exposure to fluoridated products. Furthermore, there is evidence of equal lineages of *Streptococcus mutans* in members of the same family[20]. Sociodemographic factors, such as parents' education and occupation, status of poverty, race and ethnicity have also received attention as risk factors for this disease[21-23]. In Recife (PE), an oral health care need index was developed for oral health teams in the Family Health Strategy (FHS). This index relates the type of housing and maternal education found in Form A of SIAB with regard to DMF-T-dmf-t, tooth-ache and access to the dentist over the last few years[21].

This study revealed that there are statistically significant associations between the caries risk classification, age-range of patients and the family risk scale (Tables 1 and 2). Persons in the age-range from 35 to 44 years present more chances of developing dental caries disease in comparison with the lower age-range (12 to 19 years). With regard to a survey of oral health conditions of the Brazilian population in 2002-2003[3], which took into account pain of dental origin, the percentages of this study for adults (46% *vs.* 72.9%) and adolescents (30% *vs.* 51.6%) with caries disease were higher. There is a body of evidence that proves that the presence of caries and its sequel are directly proportional to the increase in age[3,8,24]. In the adult, the greater prevalence of dental caries disease may be more of a concern, because it requires more complex treatments, of a secondary level, such as dental prostheses and implants.

The fact of the pre-existence of some family risk had significant effect, indicating greater chances of the persons at risk (R1+R2+R3) developing dental caries, in comparison with those without risk (Tables 1 and 2), reinforces the need for a planning of public policies with a view to improving the quality of life of adults, so that the population ages with health and wellbeing. When observing the

sentinel variables of the risk classification in this sample in the eastern zone of the city of São Paulo (Table 1), those who occurred in 10% or more persons comprised unemployment (N=119); systemic arterial hypertension (N=352) and high resident/room ratio (N=694). In the present study, this ratio had significant effect (Table 2). Persons who live in a residence with more than one person per room have more chances of presenting dental caries, compared with those who reported a ratio equal to or lower than 1. This finding has also been shown in researches that investigated the association between dental caries and social factors[22-24]. Coelho, Savassi[13] pointed out the resident/room ratio as an important risk evaluation indicator. Conditions sensitive to primary care, such as systemic arterial hypertension and diabetes mellitus have been contemplated in the indicators that seek the reduction in hospitalizations and mortality[16,17]. It should be pointed out that in some PHCUs, patients with these basic alterations receive priority dental treatment. However, unemployment and the resident/room ratio may be related and various factors of the socioeconomic conjunction of the country are implicated in the appearance of these sentinel variables[13,17].

The family risk variables alone (*bedridden*, *physical and mental deficiency*, *low sanitation conditions*, *severe malnutrition*, *drug addiction*, *unemployment*, *illiteracy*, *children under 6 months of age*, *persons older than 70 years*, *systemic arterial hypertension* and *diabetes mellitus*) did not characterize a significant effect in the multiple model (Table 2). Presumably, the studied sample was not sufficient for detection of the implication of the family context, although there are diverse studies that have proved a direct relationship between dental caries, socioeconomic conditions and systemic diseases[16,21-23]. Drug addiction and the presence of persons over the age of 70 years in the residence were significant in the respective simple models (Table 1), providing indications of their influence on the family in general. Drug addiction is a problem that deserves the attention of public health and unbalances the entire family. In turn, elderly persons over the age of 70 years in various circumstances also require the attention of family members.

In spite of the undeniable decline in the DMF-T, there continues to be a condition of heterogeneity in the distribution of caries, which may be explained by the precarious conditions of existence to which a broad majority of the population is submitted[1-3,9,22,23]. Vulnerable families, submitted to poor housing and working conditions receive less information about health, which causes their members to engage more easily in risk behaviors. In addition

to this, they have less access to health services with preventive purposes or in the initial stages of their treatment needs[9,17,18,23,24]. More general social and economic measures directed towards coping with social exclusion and public health interventions, targeting the more vulnerable groups at the various levels of health promotion and care, continue to challenge the Brazilian formulators and managers[1,9,23]. The system of oral health care in the FHS must follow the risk criteria in order to promote ideal health conditions in an integral, universal and equitable manner, with priority being the elimination of pain and foci of infection[4,9,10,17]. Therefore, the use of epidemiological resources is recommended, in order to identify the problems of the population described, so that actions may be implemented[10-12,16-18,21,23].

The relationship between the family risk scale and dental caries risk classification, as epidemiological tools included in the Family Health Strategy may be very useful in organization of the demand for dental treatment by the oral health teams. As an example of organization, the oral health team could first apply the family risk scale to all the families registered with the Unit. Therefore, families at risk (R1, R2 and R3) would be summoned by the CHAs for triage, with application of the dental caries risk classification, and according to each criterion, receive the oral health care according to their needs. On conclusion of dental treatment of all the families at risk, the oral health team could invite the remaining families for dental triage. This type of organization of the demand on oral health, by means of these two instruments works on the principles of equity and integrality. Therefore, it is in agreement with the principles of SUS and confirms the conclusion of the 3rd National Health Conference, at which it was affirmed that "oral health is an integral and inseparable part of general health, and is directly related to the individual's conditions of life (sanitation, food, housing, work, education, income, transport, leisure, liberty, access to and possession of land)"[25].

CONCLUSION

There was significant association between family risk and the situation of oral health, based in the dental caries risk classification, ratifying the importance of the former instrument in the organization of the demand for dental treatment. The persons who have family risk would have twice as much chance of presenting caries disease in comparison with those without risk.

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CONFLICTS OF INTERESTS

The authors declare no conflicts of interests.

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