Impact of risk assessment on the demand for dental services in Primary Health Care

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Abstract

Background: The access to dental health services is a big problem in many parts of the world. The Primary Health Care proposes the organization of the access with equity and it can be done by stratification of risk and scale of vulnerabilities. The aim was to evaluate the impact of the implementation of risk classification tools to improve the access to dental health demand in Primary Health Care and to evaluate the effectiveness of implantation of the tool: risk classification and Coelho and Savassi's scale for organization of dental health service demand in one Primary Health Service in São Paulo city.

Method: This was a cross-sectional study in which medical records (n = 1215) were evaluated before and after the implementation of the tool. The outcomes were 'immediate care', 'first dental appointment' and 'treatment completed', the independent variables were risk classification, Coelho and Savassi's scale, caries risk, periodontal disease, soft tissue, age and gender. Descriptive analyzes were performed comparing the variables of the study before and after the implantation of the tools (risk classification and "Coelho and Savassi" scale). Logistic Regression models and chi-square tests were performed to analyze these associations.

Results: The most prevalent age group was 20 to 59 years old, 62.2% before and 59.4% after implantation. The main complaint of dental demand was pain. Regarding the "Coelho and Savassi" scale", 87.1% presented low social risk (R1), 8.5% medium risk (R2), 4.2% high risk (R3). The immediate care before implantation was 9.4% (n=56) and 39.9% (n=246) after implantation ($p < 0.001$). The first dental appointment was 20.7% before implantation and 34.9% after the implantation ($p < 0.001$). Regarding the treatment completed, there was an increase from 10% to 14.1% after the implantation of the tools ($p = 0.001$).

Conclusions: The implementation of the tools 'risk classification and "Coelho and Savassi" scale' had impact in organization of odontological demand, with indicated an increase in the number of visits on the same day, first dental appointments and completed treatments. These results reinforce the importance of use of the tools to organize oral health care access.

Background

The access to dental services is still a problem in many places around the world. The ways in which the health systems are organized and social determinants are factors influencing the access to dental services, with effects on the population's oral health [1,2,3]

Access is a big challenge in a universal health system, as oral health is necessary to ensure the comprehensiveness of care. Efforts seeking to broaden this access in an equitable manner are essential.

In Brazil, for many decades, oral health care was typically sought by pregnant women and children, while other population groups accessed dental care services in emergency situations only, or did not access

them [4]. Allied to this, the demographic and epidemiological transition, with population aging the increase in the number of non-communicable chronic diseases and persistence of infectious diseases, requires changes in the organization of services to address the population's oral health problems. This model has always been criticized because of its limited coverage and limited access, contributing to an epidemiological oral health profile that is far from the one desired [5], despite universality and the right to health being constitutional [6].

Equitable access should be a constant concern when meeting spontaneous demands. To this end, there are risk assessment instruments in the literature, seeking to organize the supply of oral health services in this context.

The Brazilian Ministry of Health proposes the use of risk and vulnerability assessment by the Family Health Strategy (FHS) as a tool to identify the different risk gradations, the most urgent situations and, based on them, properly prioritize the demands to be met. As an example of what is done in emergency services, situations are classified as acute (immediate, priority or sporadic) and non-acute (scheduled interventions), and represented by colors, the color risk classification scale (CAB) [7].

Coelho and Savassi's scale [8] is an instrument for the stratification of family risk, and its purpose is assessing and monitoring the social and economic reality in the context of each family's life, to establish priorities [9]. The tendency noted with the use of this scale was that the higher the family risk, the higher the individual caries risk in children and periodontal risk in adults, proving to be an important tool for the more equitable organization and prioritization of dental actions.

The scarcity of dental health care experienced by the population improve the demand for urgency care in Oral Health Services (OHS), and despite the implementation of policies and programs aimed at organizing these services, the population still has difficulty accessing them [11], even in regions where OHSs have been implemented in the FHS [12].

Due the challenges involved in the organization of the growing spontaneous demand for oral health, this study aims to evaluate the impact of the implementation of risk assessment scale to expand the access to dental services in PHC.

Methods

This is a cross-sectional study carried out at the Jardim das Palmas Basic Health Unit (BHU), located in the southern region of the city of São Paulo, with 5 FHS teams and 3 OHS teams, consisting of Dental Surgeon, Oral Health Technician and Oral Health Assistant, providing care to 19,136 people distributed in approximately 5,638 families. The population is mostly composed of young adults aged 20–39 (n = 6738) and adults aged 40–49 (n = 2506), totaling 9,242 (48%) individuals, the remainder being divided into the age groups: less than 1 year old (n = 298), from 1 to 4 years old (n = 1117), from 5 to 6 years old (n = 587), from 7 to 9 years old (n = 911), from 10 to 14 years old (n = 1442), from 15 to 19 years old (n = 1647), and 50 years old or older (n = 3,890). Of the total, 59.02% do not have water treatment at home,

16.05% live near open sewers and 88% of the individuals are dependents of the Brazilian Unified Health System (SUS).

Until 2016, the access to oral health services occurred through priority groups, family screening with classification of biological risk and spontaneous demand. The spontaneous dental demand in this BHU was met on a first-come, first-served basis, and no instrument was used to prioritize access. Since April 2016, the BHU began using risk assessment instruments to meet the spontaneous demand: color risk classification scale [7], family risk assessment [8], caries risk and periodontal risk [12], as can see on Fig. 1. Dental health service flow chart.

In color risk classification scale, non-acute situations are identified by the color BLUE and acute situations by the colors: RED (immediate care – high risk of death), YELLOW (priority care – moderate risk), GREEN (sporadic care – low risk or no risk with significant vulnerability). In addition, “Acute” is considered priority, immediate or sporadic care, and “Non-acute” are scheduled interventions [7]. Most of the time, from the perspective of oral health complaints, pain situations are not life-threatening. Therefore, only the colors blue, yellow and green were used in this research to classify spontaneous dental demand, excluding red.

The color risk classification scale used to prioritize care adopted the colors yellow (pulpitis, edema, dental fracture, uncontrolled bleeding, joint dislocation, painful oral lesions), green (pain on probing, tenderness, trauma without acute symptoms, non-spontaneous bleeding, lesion suspected of malignancy) and blue (history of pulp or periodontal pain, history of lesions on the oral mucosa, history of bleeding without acute symptoms).

The family risk assessment instrument proposed by Coelho and Savassi [8] was also used, divided into 3 categories: R1 – low risk (score lower than 5), R2 – moderate risk (score between 7 and 8), R3 – high risk (score above 9). In the BHU where the study was conducted, Coelho’s scale is applied by the Oral Health Team, according to sociodemographic and socioeconomic data collected by the Community Health Agent (ACS), used as an instrument for organizing access.

In addition, the classification of biological risk was used to assess the risk of caries and periodontal disease, along with the soft tissue assessment proposed by the Municipal Health Secretariat of São Paulo [12]. Caries risk was classified as: Low risk (A – no caries lesion, no plaque, no gingivitis and/or no stain), Moderate risk (B – history of dental restoration, no plaque, no gingivitis and/or no active white spot, C – one or more chronic caries lesions, but no plaque, no gingivitis and/or no active white spot), and High risk (D – absence of caries lesion or history of dental restoration, but with presence of plaque, gingivitis and/or active white spot), (E – one or more acute caries lesions), (F – presence of pain and/or abscess) [12].

Periodontal risk was assessed by sextant, according to the Municipal Health Guidelines of São Paulo, and classified as: Low risk (0 – healthy periodontium), (X – absence of teeth in the sextant), Moderate risk (1 – gingivitis), (2 – supragingival calculus), (B – sequelae of previous periodontal disease), High risk

(6 – supragingival calculus visible due to gingival retraction and with reversible or no mobility), (8 – irreversible mobility and loss of function) [12].

The soft tissues were classified as: no risk (0 – normal tissues) and presence of risk (1 – soft tissue abnormalities) [12].

color risk classification scaleIn the first appointment, color risk classification scale (BLUE, YELLOW and GREEN) and Coelho and Savassi's scale were used to prioritize spontaneous demands, as well as the number of patients treated. In the second appointment, the classification of biological risk was used in association with Coelho and Savassi's scale to prioritize the access to continued dental treatment, based on the first appointment.

Coelho and Savassi's scale was applied by the OHS after calibration and collection of information from File A.

Secondary data were extracted from the medical records of the patients who accessed the dental service through spontaneous demand in the period prior to (from April 2015 to March 2016) and one year after the implementation of risk assessment (from April 2016 to March 2017), corresponding to a total of (n = 1215) cases.

As inclusion criteria, the records of patients who sought the service through spontaneous demand from April 2015 to March 2017 were evaluated, and the records of cases with no information on more than 70% of the variables were excluded from the study.

The main explanatory variables analyzed were the use of color risk classification scale and Coelho and Savassi's family risk scale [8] as instruments for organizing and prioritizing spontaneous demands. The data on caries risk, periodontal disease, soft tissue, age and sex, adopted as independent variables for adjustment, were obtained from the spontaneous demand monitoring worksheet.

So, this study analyzed the influence of the implementation of color risk classification scale [7], Coelho and Savassi's scale [8] and the biological risk scale [12] on the access to dental services through spontaneous demand, first scheduled appointment and the resolvability of treatment based on the number of completed treatments (CT).

The study's dependent variables were access and resolvability. The following variables were used as proxy for Access: 1) first scheduled dental appointment (yes and no), and 2) sporadic care (yes and no), referring to patients who sought the service through spontaneous demand and were seen on the same day. Resolvability was analyzed based on the number of Completed Treatments (CT) (yes and no).

The clinical complaint and diagnostic hypothesis (DH) variables were grouped into the following categories: Clinical complaint – Broken tooth (broken filling and decayed tooth); Pain (toothache and tenderness); Swelling (swollen tooth and face); Gum inflammation (bleeding and loose tooth); Trauma; Others (crooked teeth, stain on teeth, broken dentures, wants to remove tooth or stitches, mouth sore and

lip sore); Shedding of deciduous teeth. The diagnostic hypothesis variable was grouped into the following categories: Caries/pulp-related disease (abscess, infection, fistula, apical injury, endodontics, pulpitis, extraction, residual root, pericementitis, restoration and caries); Periodontal disease (gingivitis, hyperplasia, periodontitis, inflammation, mobility, periodontics, scraping, gingival retraction, abfraction, tenderness, pericoronitis, impacted teeth); Eruption; Exfoliation; Trauma (facial trauma, dental trauma, intrusion, dislocation, fracture; Other (occlusal adjustment, bruxism, cementation, TMD, pigmentation, partial dentures, X-ray, suture removal, no abnormalities, oral lesions). The color risk classification scale variable is represented by the colors yellow, green and blue.

The associations between the study's variables were analyzed according to the implementation of the demand organization instruments (color risk classification scale and Coelho and Savasse's scale), using chi-square tests. The association between independent variables (socioeconomic and demographic variables) and dependent variables (first appointment, type of access and resolvability with the risk scales' implementation) was analyzed using Logistic Regression. Moreover, bivariate analyses were performed using the chi-square test to evaluate the associations between each risk assessment instrument, e.g., between color risk classification scale and the other variables, and Fisher's exact test was used to evaluate the association between Coelho and Savassi's scale and the other variables. The significance level adopted was 5%. The analyses were performed on software R version 3.2.2.

The research project was approved by the Research Ethics Committee of School of Dentistry of Piracicaba, São Paulo, Brazil (CEP-FOP/UNICAMP), according to Resolution 466/12 of the Brazilian National Health Council.

Results

The analyzed data were collected from 1215 records that met the inclusion criteria. Table 1 shows the number and profile of patients who accessed UBS Jd. das Palmas' dental service through spontaneous demand, before and after the implementation of risk assessment.

Soft tissue risk and periodontal tissue risk were not described by the OHS prior to the implementation of risk assessment, being found in only a few medical records. The data were registered after the implementation of the new spontaneous demand record. Thus, it was observed that, of the total patients, 85.2% (n=525) were at moderate risk of periodontal disease, and 99% (n=610) were at low risk of soft tissue injuries.

Coelho and Savassi's scale was evaluated after the implementation of risk assessment, with 87.1% (535) of cases being classified as low risk (R1), 8.5% (n = 52) as moderate risk (R2), and 4.2 % (n = 26) as high risk (R3) ($p < 0.001$).

In relation to color risk classification scale, it was observed that 22.55% (n = 138) of cases were classified as yellow (priority care), 42.2% (n = 259) as green (sporadic care), and 35.3% (n = 217) as blue (scheduled/non-urgent intervention) ($p < 0.001$).

The Sporadic Care, First Dental Appointment and Completed Treatment variables were analyzed according to the implementation of color risk classification scale and Coelho and Savassi's scale, age, sex, complaint, DH and risks (Table 2).

No statistically significant differences were found when analyzing variables: caries risk, soft tissue risk and periodontal risk, DH, and the outcomes of sporadic care, first dental appointments, and completed treatments (Table 2).

Table 3 shows the distribution of family risk (Coelho and Savassi's scale) and variables: caries risk, periodontal risk, color risk classification scale (CAB), sporadic care, first appointment and CT. A statistically significant association between family risk and periodontal risk was estimated ($p=0.046$).

Table 4 shows the distribution of color risk classification scale and variables: caries risk, periodontal risk, Coelho and Savassi's scale, sporadic care, first appointment and number of completed treatments. Regarding caries risk and color risk classification scale, the results pointed to an association between yellow/green risks (priority or sporadic care) and high caries risk ($p<0.001$). When we evaluated the association between number of completed treatments and color risk classification scale, the results were statistically significant ($p=0.028$).

Discussion

The study used risk assessment as an instrument to organize the access to dental care, demonstrating that using risk assessment tools increased the access of patients who sought the service for urgent reasons, as well as the access to the first dental appointment and the number of completed treatments.

As spontaneous demand is one of the ways through which patients seek access to the BHU, a window of opportunity opens for the team to interact with the population and, consequently, obtain information on the needs of access to these services. In this way, the knowledge about the profile of patients who seek emergency care in the unit generates subsidies for improving the OHS team's work process, ensuring that the population's needs are satisfactorily met.

The imbalance between supply and demand are also factors influencing the organization of the access to dental services, allied to the insufficient quantity of OHSs to cover a territory with social differences and increasing number of individuals who depend on SUS.

A study carried out in São Paulo evaluated the access to dental services following the implementation of the Brasil Sorridente program in 2004 and found that socioeconomic inequalities in this access still persist, despite the improvements in the oral health coverage system [14].

Using risk assessment instruments, as proposed in this study, enhances the access to the first appointment through spontaneous demand. A study conducted in Recife attributed the lack of registration of procedures by health professionals to the low access to the first dental appointment, as well as to care practices being focused on the main complaint without formulation and execution of a

preventive therapeutic plan to meet the detected needs, requiring greater attention in the organization of this access [15].

The main reason that led patients to seek urgent dental care was pain, followed by complaints of broken tooth and gingival inflammation, as also observed in other studies [16, 17, 18].

Although pain relief and restoration of masticatory function are the main reasons reported [19, 20], it is known that patients tend to use urgent care as an alternative “gateway” to obtain dental care [12], hence why it is important to use instruments to identify and assist in the organization of access, integrating health care and prevention/promotion, allowing the development of patient-centered care practices [21].

When analyzing the age of the patients who sought the service, adults aged 20–59 predominated, similarly to a study conducted in the countryside of São Paulo, where 63.85% of those whose access to oral health care happened through spontaneous demand were aged 20–49 [12]. This suggest the difficulty of access to adult dental services, leading to tooth loss [14]. In a research performed to assess the oral health of adult workers, tooth loss ranged from 18–81% in the nine age groups studied, with the higher percentages corresponding to older individuals [22], indicating a cohort effect with a history of absence of Public Policies focused on the oral health of adults and older adults.

One reason why the adults had completed fewer treatments could be the limitation in the opening hours of oral health services, a fact that is corroborated by the National Oral Health Policy [23], which states that adults, especially workers, have difficulty accessing health units.

The lower demand for these services by the older population was justified in another study as being due to the lack of teeth [14] and was also observed in the National Health Survey (2013) [24], where 28.9% of those aged 60 or older had not seen a dentist. The study by Kaliembo et al [25], conducted in developing countries, assessed the prevalence of oral health needs of adults aged 50 and older that had not been met, obtaining high values for China, Ghana and India. A study conducted in São Paulo revealed the difficulty of access to public dental care, with reduction in the provision of services for adults and older adults [26]. These data demonstrate that a population with priority health care needs could be experiencing difficulty accessing health services.

However, the results of the present study showed that the access of patients aged 60 or older to the first dental appointment had improved, a relevant fact considering that for years this population was denied access to oral health services, culminating in the worsening of oral diseases and edentulism. This result points to the use of risk assessment as an important instrument for ensuring equity in the organization of access, seeing as health teams are constantly faced with the difficulty of planning and prioritizing care, failing to meet the needs of the population due to the high demand for dental services [27].

The adoption of risk stratification protocols has become increasingly common, especially in emergency services. The use of these protocols and their respective scales has an important impact on the quality of the access of these services [7].

The results showed an increase in the number of first appointments following the adoption of risk assessment, favoring the continuity and management of care [7]. When assessing the implementation of color risk classification scale [7], we identified an association between caries risk and number of completed treatments. These results indicate that patients at higher risk of caries were identified as high priority, resulting in better resolvability due to the increase in the number of completed treatments.

It is important that, in addition to clinical and biological risks, family risk is also assessed. In this study, we found that most families who had access to dental services (87.1%) were at low family risk, and 4.2% were considered as high risk, requiring more attention from the oral health team. Some studies using family risk assessment have identified a relationship between high family risk and higher chance of caries [28]. However, in the present work, we only found association between periodontal disease and family risk, corroborating the study by Peres et al [10].

Given the growing demand for health services, many studies have been trying to answer how best to organize the access to PHC. One of the models proposed in the literature is advanced access, which aims to “do today’s work today” [29]. However, this model has not yet been extensively explored in Dentistry, and we have as challenge proposing models of organization of access that allow spontaneous demands to be satisfactorily met, ensuring the continuity of care and promoting preventive actions.

A limitation of this study concerns the collection of secondary data from medical records, as the access to information is restricted to the data available. However, attentiveness on the part of the team responsible for the records was noted, which greatly contributes to the acquisition of knowledge, and there was a robust supply of information to be used in the analysis. Although associations with risk assessment were verified, the influence of time was not considered.

Conclusions

The study provides relevant data regarding the organization of dental services, demonstrating the importance of having one or more risk assessment instruments, which may contribute to a better understanding of the needs of the population covered by Family Health Strategy and assist the Oral Health Services in the organization of dentist schedule, possibly promoting the development of an instrument that is capable of addressing the most important indicators used in the present study.

The implementation of risk assessment instrument impacted the organization of population demand, improving the resolvability of oral health care by increasing the access of patients seeking the service for urgent reasons, as well as the access to the first dental appointment and the number of completed treatments.

Declarations

Ethics approval and consent to participate: The research project was approved by the Research Ethics Committee of School of Dentistry of Piracicaba, São Paulo, Brazil (CEP-FOP/UNICAMP), according to

Resolution 466/12 of the Brazilian National Health Council.

Consent for publication All authors declare consent for publication.

Availability of data and material: The dataset is available to researchers who wants to explore the data. Researchers that wants to explore the datasets please send email to: danielle.ramos@einstein.br

Competing interests All authors declare have no conflict of interest

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Authors' contributions: The authors' contributions are: Danielle Viana Ribeiro Ramos participated in the project, planning, analysis, interpretation and writing of the work; Camila Nascimento Monteiro participated in the analysis, interpretation; Danielle Borchardt participated in the conception and planning; Leonardo Tribis participated in the conception and planning; Thais Paragis Sanches participated in the conception and planning; Daiana Bonfim participated in the conception and writing of the work; Danielle da Costa Palacio participated in the conception and planning; Maria da Luz Rosario de Sousa participated in the Interpretation and writing of the work; Marília Jesus Batista de Brito Mota participated in the project, planning, analysis, interpretation and writing of the work. All authors approved a final submitted version.

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Abbreviations

BHU - Basic Health Unit

CAB - Color risk classification scale

FHS - Family Health Strategy

OHS - Oral Health Services

SUS - Brazilian Unified Health System

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Tables

Table 1. Patients assisted in dental health care before and after implementation of risk classifications. São Paulo, 2015-2017.

		Before inplementation	After implementation	p-value
		n (%)	n (%)	
		599	616	
Age (years)	0 to 11	125 (21,1)	138 (22,5)	0,819
	12 to 19	64, (10,8)	70 (11,4)	
	20 to 59	368 (62,0)	364 (59,4)	
	60 or more	36 (6,1)	41 (6,7)	
Sex	Male	235 (39,2)	247 (40,1)	0,758
	Female	364 (60,8)	369 (59,9)	
Clinical Complaint	Broken tooth	184 (30.7)	204 (33.1)	0.268
	Pain	278 (46,4)	266 (43,2)	
	Swelling	25 (4.2)	37 (6.0)	
	Gum inflammation	41 (6.8)	34 (5.4)	
	Trauma	9 (1.5)	14 (2.3)	
	Shedding of deciduous teeth	39 (6,6)	40 (6,5)	
	Others	23 (3,8)	21 (3,00)	
	not applicable	0 (0.0)	3 (0.5)	
Diagnostic hypothesis	Caries/pulp-related disease	482 (80.5)	431 (70.0)	<0.001
	Periodontal disease	54 (9.0)	52 (8.4)	
	Eruption	16 (2.7)	33 (5.4)	
	Exfoliation	11 (1.8)	23 (3.7)	
	Trauma	22 (3.7)	57 (9.3)	
	Others	14 (2.3)	19 (3.1)	
	Unable to evaluate	0 (0.0)	1 (0.2)	
Carie risk	High risk	594 (99.3)	577 (93.7)	<0.001
	Low risk	2 (0.3)	27 (4.4)	
	Risco moderadoModerate risk	1 (0.2)	11 (1.8)	
Periodondal risk	High risk	30 (5.0)	90 (14.6)	<0.001
	moderadoModerate risk	58 (9.7)	525 (85.2)	
		21 (3.5)	610 (99.0)	<0.001
Soft tissues risk	No			
	Yes	4 (0.7)	5 (0.8)	
		542 (90,6)	370 (60,1)	<0.001
IImmediate care	No			
	Yes	56 (9.4)	246 (39.9)	
First dental appointment	No	475 (79.3)	392 (63.6)	<0.001
	Yes	124 (20.7)	215 (34.9)	
Completed treatment	No	539 (90.0)	520 (84.4)	0.001
	Yes	60 (10.0)	87 (14.1)	

*Note: sum will not be 100% due to missing data

Table 2. Association between outcomes and patient profile. São Paulo, 2015-2017.

	Atended on the same day	First appointment	Completed treatment
implementation of risk classification tools	**6,43 (4,68-8,85)**	**2,19 (1,69-2,83)**	**1,66 (1,17-2,34)**
Adjusted implementation of risk classification tools*	**4,73 (1,45-15,41)**	**2,25 (1,73-2,92)**	1,57 (0,41-5,98)
Age			
0 to 11 years	1	1	1
12 to 19 years	0,76 (0,45-1,27)	0,92 (0,57-1,47)	0,65 (0,35-1,21)
20 to 59 years	0,80 (0,57-1,12)	0,92 (0,67-1,26)	**0,61 (0,41-0,90)**
60 or more	0,72 (0,38-1,36)	**1,74 (1,02-2,97)**	0,98 (0,49-1,93)
Sex			
Male	1	1	1
Female	**1,36 (1,02-1,82)**	**2,19 (1,69-2,82)**	**1,66 (1,17-2,34)**
Clinical Complaint**			
Pain	1	1	1
Broken tooth	1,16 (0,84-1,61)	1,23 (0,88-1,71)	1,15 (0,76-1,75)
Swelling	1,12 (0,59-2,15)	1,05 (0,54-2,03)	1,14 (0,49-2,69)
Gum inflammation	1,41 (0,77-2,57)	1,44 (0,79-2,62)	1,73 (0,84-3,58)
Trauma	**2,71 (1,06-6,93)**	**2,78 (1,11-7,04)**	0,51 (0,11-2,40)
Others	1,33 (0,61-2,88)	1,04 (0,44-2,45)	1,47 (0,49-2,69)
***Diagnostic Hypothesis Groups**			
Caries/pulp-related disease	1	1	1
Periodontal disease	1,16 (0,69-1,92)	1,48 (0,59-3,75)	1,37 (0,67-2,83)
Trauma	1,02 (0,59-1,75)	0,94 (0,49-1,83)	1,11 (0,52-2,32)
Others	1,81 (0,81-4,02)	0,81 (0,54-1,46)	0,38 (0,79-1,82)
Carie risk			
No	1	1	1
Yes	1,01 (0,98-1,04)	1,01 (0,98-1,04)	0,97 (0,86-1,10)
Periodontal risk			
No	1	1	1
Yes	1,00 (0,99-1,01)	1,00 (0,99-1,01)	0,99 (0,98-0,099)
Soft tissues risk			
No	1	1	1
Yes	0,99 (0,98-1,01)	1,00 (0,98-1,07)	1,00 (0,98-1,01)

Adjusted by Age, sex, clinical complaint, Diagnostic Hypothesis Groups, Carie Risk, Periodontal Risk, Soft Tissue risk

Table 3. Prevalence of family risk classification, caries risk, periodontal risk, color risk, CAB, day care, first consultation and treatment completed. São Paulo, 2015-2017.

Family risk	Low vulnerability	High vulnerability	p-value
	% (n)	% (n)	
Carie Risk			
High risk	87,13% (501)	12,87% (74)	0,455
Moderate/low risk	89,47% (34)	10,53% (4)	
Periodontal risk			
Moderate risk	81,11% (73)	18,89% (17)	0,046
High risk	88,34% (462)	11,66% (61)	
Color risk classification scale			
Yellow/green	85,61% (339)	14,39% (57)	0,064
Blue	90,23% (194)	9,77% (21)	
Atended on the same day			
No	86,99% (321)	13,01% (48)	0,449
Yes	87,70% (214)	12,30% (30)	
First dental appointment			
No	88,17% (343)	11,83% (46)	0,172
Yes	85,12% (183)	14,88% (32)	
Completed treatment			
No	86,46% (447)	13,54% (70)	0,173
Yes	90,80% (79)	9,20% (8)	

*CAB: escala de risco por cores – Cadernos de Atenção Básica nº 28 - Volume II. Ministério da Saúde. 2012

Table 4. Association between color risk classification and caries risk, periodontal risk, Coelho and Savassi scale, day care, first dental appointment and treatment completed. São Paulo, 2015-2017.

	Blue	Yellow/green	Qui-square test p-value
	% (n)	% (n)	
Carie Risk			**<0,001**
High risk	33,39% (192)	66,61% (383)	
Moderate/low risk	63,16% (24)	36,84% (14)	
Periodontal Risk			0,172
Moderate risk	36,33% (190)	63,67% (333)	
High risk	28,89% (26)	71,11% (64)	
Coelho and Savassi scale			0,102
Low vulnerability	36,40% (194)	63,30% (339)	
High vulnerability	26,92% (21)	73,08% (57)	
Immediate care			0,224
No	33,42% (123)	66,58% (245)	
Yes	38,21% (94)	61,79% (152)	
First dental appointment			
No	34,87% (136)	65,13% (254)	
Yes	36,28% (78)	63,72% (137)	
Completed treatment			0,028
No	33,78% (175)	66,22% (343)	
Yes	45,98% (40)	54,02% (47)	

Figures

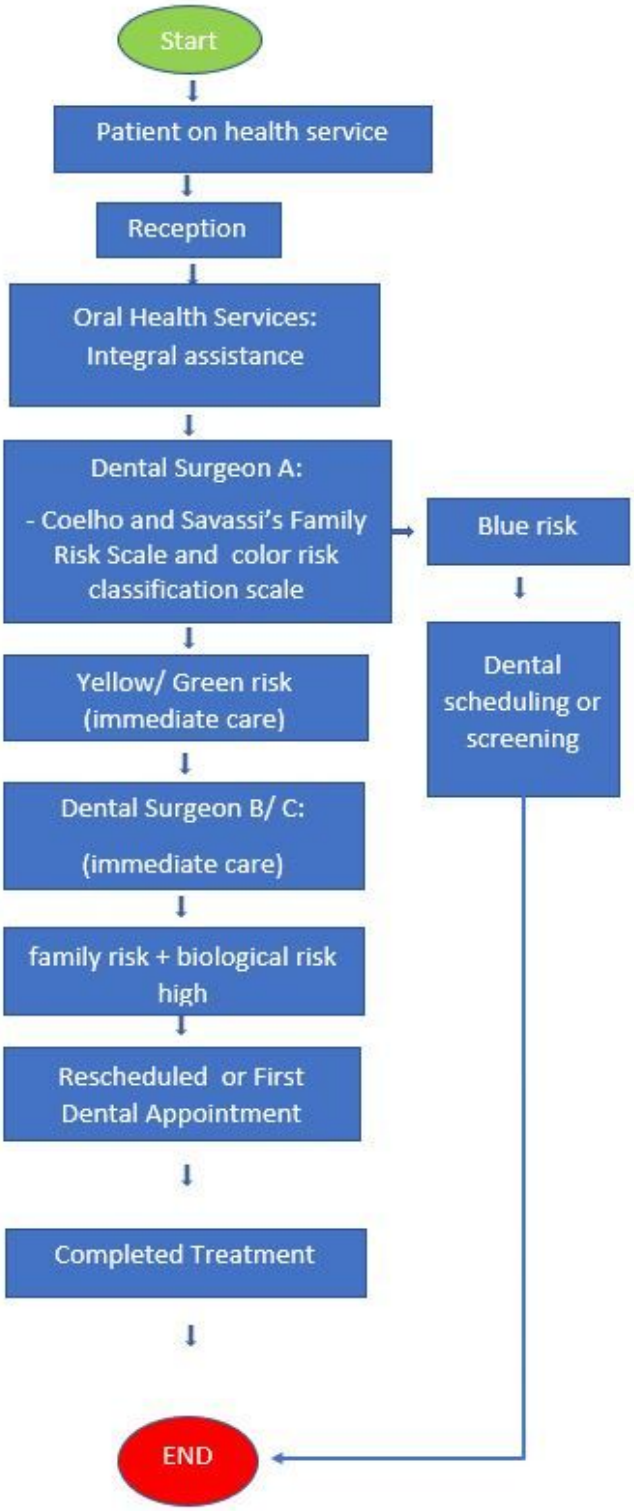

Figure 1

Dental health service flow chart