

# A survey on interdisciplinary oral care in children

Artnora Ndokaj

"Sapienza" University of Rome, Department of Oral and Maxillo-Facial Sciences, Via Caserta 6, 00161 Rome, Italy

ORCID: 0000-0002-1400-8607

✉ artnora.ndokaj@uniroma1.it

## ABSTRACT

**Introduction:** The aim of this study was to evaluate an interdisciplinary approach to the field of pediatric dentistry in a group of Italian dentists who focused their activities on pediatric dentistry.

**Materials and methods:** The survey was carried out during the months of September and October 2020. The questionnaire was developed using Google Forms and sent anonymously to a total of 58 dentists from the Department of Oral and Maxillo-Facial Sciences of Rome, Italy. The form consisted of 2 parts: (A) gathered demographic and professional data, including specialty (questions n = 3), and (B) was centered around interdisciplinary treatment in pediatric dentistry (questions n = 7).

**Results:** A total of 51 dental practitioners participated to this study: 56.9% (n = 29) were female and 43.1% (n = 22) were male; 87.9% of the contacted dental professionals answered the questionnaire.

**Conclusions:** The results of this preliminary study on an interdisciplinary approach to pediatric dentistry clearly show that this concept must be implemented. In fact, the responses to this survey highlighted how sectorized pediatric dentistry is. There would be a clear benefit from a greater integration, resulting in the best dental care practices for pediatric patients.

**Keywords:** oral care; pediatric dentistry; dentists; interdisciplinary communication; questionnaires and surveys.

## INTRODUCTION

In recent decades, the development of pediatric dentistry has led to the creation of specialized departments of oral care for patients at developmental ages.

Pediatric dentistry is no longer purely based on conservative dentistry and now has aspects of traumatology [1, 2], orthodontics [3, 4, 5, 6, 7, 8], dietary and lifestyle counseling [9, 10, 11, 12], esthetic treatment of developmental defects of enamel [13, 14], the spread of social media and new media use [15, 16], and oral surgery [17, 18, 19].

The aim of the study was to evaluate an interdisciplinary approach to the field of pediatric dentistry in a group of Italian dentists.

## MATERIALS AND METHODS

The target population was a group of Italian dentists who focused their activities on pediatric dentistry. Informed consent was obtained from all individuals. All procedures were in accordance with the 1964 Helsinki Declaration and its later amendments. The survey was carried out during the months of September and October 2020.

The questionnaire was developed using Google Forms and sent to a total of 58 dentists from the Department of Oral and Maxillo-Facial Sciences of Rome, Italy. All responses were anonymous.

The questionnaire consisted of 2 parts. Part A gathered demographic and professional data, including specialty

(questions n = 3), and part B was centered around interdisciplinary treatment in pediatric dentistry (questions n = 6).

The queries related to the questionnaire are reported in table 1.

## RESULTS

### Demographic characteristics

A total of 51 dental practitioners participated to this study: 56.9% (n = 29) were female and 43.1% (n = 22) were male; 87.9% of the contacted dental professionals answered the questionnaire.

More than half of the respondents were graduates in dentistry without a specialty (52.9%), followed by those with a specialty in pediatric dentistry (23.5%), oral surgery (9.8%) and orthodontics (13.8%).

### Conservative dentistry

Participants declared they performed conservative dentistry procedures at the following rates: i) never: n = 3 (5.8%); ii) >15/month: n = 9 (17.6%); iii) 5-10/month: n = 18 (35.2%).

### Dental traumatology

Participants declared they performed pediatric dental trauma procedures at the following rates: i) never: n = 18 (35.3%); ii) >15/month: n = 2 (3.9%); iii) 5-10/month: n = 9 (17.6%).

TABLE 1. The answers given by the respondents

Queries	Answers	n
1. Age	24–39	23 (45.0%)
	40–49	14 (27.5%)
	50–69	14 (27.5%)
2. Gender	women	29 (56.9%)
	men	22 (43.1%)
3. Specialty	none	27 (52.9%)
	pediatric dentistry	12 (23.5%)
	oral surgery	5 (9.8%)
	orthodontics	7 (13.8%)
4. How often do you perform conservative pediatric dentistry per month?	never	3 (5.8%)
	2–5/month	10 (19.6%)
	5–10/month	18 (35.2%)
	10–15/month	11 (21.5%)
	>15/month	9 (17.6%)
5. How often do you treat a pediatric dental trauma per month?	never	18 (35.2%)
	2–5/month	15 (29.4%)
	5–10/month	9 (17.6%)
	10–15/month	7 (13.7%)
	>15/month	2 (3.9%)
6. How often do you perform oral surgery pediatric dentistry per month?	never	35 (68.6%)
	2–5/month	10 (19.6%)
	5–10/month	4 (7.8%)
	10–15/month	2 (3.9%)
	>15/month	0
7. How often do you perform resin infiltration pediatric dentistry per month?	never	38 (74.5%)
	2–5/month	9 (17.6%)
	5–10/month	3 (5.8%)
	10–15/month	1 (1.9%)
	>15/month	0
8. How many patients with interceptive orthodontics visit you per month?	none	32 (62.7%)
	2–5/month	2 (3.9%)
	5–10/month	10 (19.6%)
	10–15/month	4 (7.8%)
	>15/month	3 (5.8%)
9. How many pediatric patients undergo preventive dentistry sessions monthly in your practice?	none	2 (3.9%)
	2–5/month	32 (62.7%)
	5–10/month	15 (29.4%)
	10–15/month	1 (1.9%)
	>15/month	1 (1.9%)

### Oral surgery

Participants declared they performed oral surgery procedures at the following rates: i) never: n = 35 (68.6%); ii) >15/month: n = 0; iii) 5–10/month: n = 4 (7.8%).

### Resin infiltration

Participants declared they performed resin infiltration procedures at the following rates: i) never: n = 38 (74.5%); ii) >15/month: n = 0 (0%); iii) 5–10/month: n = 3 (5.8%).

### Interceptive orthodontics

Participants declared they performed interceptive orthodontic procedures at the following rates: i) never: n = 32 (62.7%); ii) >15/month: n = 3 (5.8%); iii) 5–10/month: n = 10 (19.6%).

### Preventive dentistry

Participants declared they performed preventive dentistry procedures at the following rates: i) never: n = 2 (3.9%); ii) >15/month: n = 1 (1.9%); iii) 5–10/month: n = 15 (29.4%).

## DISCUSSION

This survey was conducted during the months of September and October 2020 with an aim to assess an interdisciplinary approach to the field of pediatric dentistry in a group of Italian dentists. The results of the study showed that the general trend is to sectorize clinical activity at the expense of an overall vision. Professionals prefer to treat patients within their own specialty. On the other hand, the approach to the pediatric patient requires comprehensive interdisciplinary knowledge. The discussion presents an overview of the interdisciplinary aspects of pediatric dentistry.

### Conservative dentistry

The mineralized tissues in the oral cavity are in equilibrium when environmental conditions, the host and genetic factors favor this balance. In fact, the buffering capacity of saliva in an acidic environment keeps the balance between demineralization and remineralization constant. However, when the diet is rich in fermentable carbohydrates, demineralization can no longer be prevented by the actions of saliva alone [20]. A recent report by WHO showed that 20–90% of 6-year-old children in Europe have dental caries, and at age 12, an average of 0.5–3.5 permanent teeth are affected by this disease [21]. This clinical scenario is far from being a caries-free pediatric population.

The clinical protocols in conservative dentistry in pediatric patients focuses on primary and secondary prevention in order to ensure both the least invasive treatment and a minimally invasive approach. In addition, primary and secondary prevention in a young population necessitates monitoring the progression of enamel demineralization over time. The dynamic and multifactorial nature of the caries process and the change in the way of understanding it calls for a continuous search for knowledge in order to: i) diagnose enamel lesions at an early stage; ii) halt the development of caries; iii) prevent the need for a more invasive treatment.

The process of diagnosing enamel demineralization on occlusal surfaces has changed in the last few decades. Today it is based on modern, reliable and side-effect-free diagnostic tools, such as intra-oral fluorescence-based cameras. These cameras use wavelengths of radiation with no harmful effects to the patient and the assessment can be repeated any number of times, which ensures a good follow-up that is appropriate for both a young and a high-risk patient population [22, 23]. In the past, bitewing examination was used to diagnose and monitor caries activity and pediatric dentists recommended bitewings routinely. According to the guidelines of the American Academy of Pediatric Dentistry and European Academy of Pediatric Dentistry, bitewing examinations should not be repeated any earlier than 6 months and 12 months, respectively [24]. This is a long period of time in which carious lesions may develop in patients who have a high caries risk [25, 26, 27, 28]. A study by Jablonski-Momeni et al. showed that the detection of occlusal caries using bitewing radiographs reported the lowest correlation to gold standard, as well as being the

lowest quality diagnostic method in relation to the detection of occlusal changes [22].

A recent *in-vivo* study aimed to assess the correlation of fluorescence-based camera assessment, visual inspection and radiographic examination x-rays bitewings to the extent of caries after excavation in a young population. The study results showed that all the occlusal sites assessed by fluorescent camera ranged 1.7–2, indicating in all cases deep enamel lesions with possible extent to dentine. By contrast, the radiographic evaluation showed diagnostic accuracy in 6% of the sample. A VistaCam measurement of 1.7 was correlated to a cavity with 3.5, 2.8 and 3.2 mm of depth, width and length after lesion excavation [29].

Therefore, visual and fluorescence-based methods are proposed as the caries detection method of choice in young populations, which may help to avoid multiple diagnostic testing, over/under-diagnosis, over/under-treatment and exposure to x-rays [30, 31].

Conservative dentistry in the pediatric population promotes minimally invasive treatment and is based on Atraumatic Restorative Treatment. Removal of carious lesions and isolation of enamel/dentine tissues from the oral cavity helps in maintaining tooth vitality and teeth presence until the eruption of permanent dentition.

### Dental traumatology

Pediatric dental traumas are common and typical in schools and sports. The treatment of dental trauma, especially the avulsion of permanent upper incisors, requires strict adherence to guidelines and operating protocols [1, 32]. The long-term prognosis of a tooth avulsion and re-implantation depends on many clinical variables. If not observed, side effects such as an inflammatory and replacement root resorption leading to tooth loss (with important consequences in terms of quality of life and rehabilitation costs) can occur [33, 34, 35].

### Oral surgery

Oral surgery in pediatrics can include orthodontic surgery, soft tissue surgery, and extractive surgery [36, 37]. In orthodontics, the most common indication is intervention in the case of bone inclusions in various sections of the mouth [38]. In addition, as part of orthodontic surgery, germectomy of the 3rd mandibular molar is performed to facilitate tooth eruption and prevent further dental inclusions [39]. These interventions are locally invasive and may benefit from kinesiotaping to control edema, trismus and pain [17]. Soft tissue surgery includes surgery of the labial and lingual frenulum, as well as the removal of neoformations such as mucous and fibroids [40].

### Resin infiltration

The oral cavity of a pediatric patient has become important in the early diagnosis of malabsorptive disorders, because the presence of dental enamel defects and aphthous-like ulcers could be used as a warning sign for possible atypical and asymptomatic forms of coeliac disease [41, 42]. Moreover, autoimmune diseases, such as type 1 diabetes, thyroiditis,

Sjogren's syndrome, neurological and psychological disturbances, ataxia, autism, depression, epilepsy with intracranial calcifications, osteopenia/osteoporosis are hypnotized to be secondary diseases to untreated coeliac disease.

In fact, the mineralized tissues of the tooth constitute a detailed biological archive of individual growth, diet, mobility, and possible pathologies. This information is permanently recorded in dental enamel, and remains mostly unaltered after dental crowns. Indeed, dental enamel does not remodel once its secretion and mineralization end [43].

Furthermore, tooth tissues are deposited incrementally according to a circadian rhythm, recording individual growth rates which can be directly measured thanks to their layered structure. Enamel formation of primary dentition begins during intrauterine life, starting from the 2nd trimester of pregnancy and proceeding until the first years of life. Permanent dentition starts at birth with the formation of the 1st molar and continues until the pre-adolescence period with the calcification of the crowns of the other permanent elements. The crown formation (phase of secretion and phase of mineralization) precisely reflects and records the individual daily biological life history, and the histomorphometry of dental enamel and offers the opportunity for a retrospective and longitudinal analysis of fetal and infant growth and development [43].

The treatment of developmental defects of enamel is required on a daily basis by parents and children concerned with the esthetic appearance of the upper permanent incisors [14, 44]. The resin infiltration method has been successfully used to treat hypomineralized lesions of enamel, with an improvement in esthetics, by increasing the refractive index of the lesion which consequently takes on the appearance of the surrounding sound enamel with restoration of the enamel translucence [14, 45]. The objective documentation of the esthetic outcome of this procedure and its durability over time (color stability) can be assessed by means of spectrophotometry. This method allows to collect data on the color of enamel surface, with information available at every 8 nm of the tooth surface. Then, the on-board software calculates Commission Internationale de L'éclairage L\*a\*b\* color coordinates for specific tooth areas, that allows to do further calculations and evaluations on color changes and stability [46].

### Interceptive orthodontics

Interceptive orthodontics is dedicated to the treatment of malocclusion in children [47]. It aims to diagnose and treat any alteration in the growth and development of jaw bones, and to correct bad habits and assess day and night parafunctions [48, 49, 50, 51]. For this purpose, in our clinical activity elastodontic removable appliances are frequently referred to which can be used in 2nd dental classes with increased overjet and overbite in patients with hypo and normal divergence [52].

### Preventive dentistry

Preventive dentistry in children aims to protect the oral health of a patient during developmental ages. This goal can be

achieved through oral hygiene instructions, brushing methods, use of sealants, topical application of fluoride, identification of profiles and lifestyles that put the individual at increased risk of caries [53, 54, 55, 56, 57, 58, 59, 60, 61].

## CONCLUSIONS

The results of this preliminary study on the interdisciplinary approach in pediatric dentistry clearly show that this concept must be implemented. In fact, the responses to this survey highlight the how sectoralized pediatric dentistry is. There would be a clear benefit from a greater integration, resulting in the best dental care practices for pediatric patients.

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