

Knowledge and attitude in paediatric dentistry among paediatricians



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Abstract

Aim Tooth decay is the main oral pathology and a worldwide public health problem. The paediatrician is the first medical professional to assess and treat children. Therefore, it is important that they are well informed. The aim is to determine the level of dental knowledge of paediatricians practising in the public and private health sectors in Catalonia (Spain).

Materials and methods Cross-sectional, descriptive, and analytical study of the basic dental knowledge of paediatricians through an anonymous and voluntary survey of 17 questions on prevention, trauma and dental cavities. The results are segmented based on professional experience, type of centre and whether it has a paediatric dentistry area.

Results A total of 129 paediatricians from Catalonia participated. Almost all paediatricians (86.82%) normally perform an oral examination in a routine visit; 31.8% refer the child to the paediatric dentist when the first permanent molars have erupted, and 41.9% indicate that toothpaste should contain a minimum of 1,000 ppm of fluoride. It is proven that paediatricians practising in the private sector have greater dental knowledge than those in the public sector ($p = 0.019$). Experience is not related to knowledge ($p = 0.0691$). The paediatricians who have a paediatric dentistry area in their workplace show greater knowledge ($p = 0.046$).

Conclusion Only half of the surveyed paediatricians follow the recommendations of paediatric societies on prevention aspects. In dental traumatology, professionals mostly follow the recommendations supported by the literature with high scientific evidence.

KEYWORDS Knowledge; Paediatric Dentists; Paediatricians; Prevention; Oral Health.

Introduction

Traditionally there has always been a dividing line between Medicine and Dentistry, with doctors treating diseases of the body and dentists treating disorders of the oral cavity. However, this line is gradually blurring every day [Krol, 2003;

Dickson-Swift et al., 2020]. According to the definition of the World Health Organization (WHO), health is “a state of complete physical, mental and social well-being”, and not merely the absence of disease. In this sense, oral health must not be considered as independent from overall health [American Academy of Pediatrics, 2008; Aburahima et al., 2020].

Currently, cavities are the most common chronic disease in childhood [Colombo et al., 2019; Paglia et al., 2019; Meriç et al., 2020] affecting more than 530 million children under 6 years of age [American Academy of Pediatrics, 2008]. However, it is a potentially preventable disease if the risk factors that cause it are controlled. These aetiological factors may be influenced by parents and the professionals that attend the child and their close contacts, if they have suitable knowledge of oral health guidelines [Edelstein, 2018; Andreasen et al., 2012].

Oro-dental traumas are the second cause of emergency dental care after cavities. Most of them involves the top front teeth and can cause functional, phonetic, aesthetic and psychological problems. The prognosis for dental injuries depends on the time elapsed between the injury and the start of treatment. For this reason, a paediatrician’s knowledge of how to handle dental trauma is crucial [Andreasen et al., 2012; Loureiro et al., 2019].

Although healthcare education relating to dentistry has significantly improved over the last few years, it is still not common practice to take children to the dentist for regular check-ups when there is no apparent oral disease. According to the American Academy of Pediatrics, 89% of babies and one-year-olds go to a paediatrician annually, while only 1.5% go to a paediatric dentist. Visits to paediatricians exceeded visits to paediatric dentists by 250:1 for this age group [American Academy of Pediatrics, 2008]. It is essential that paediatricians know about dental matters in order to have a motivating role in oral prevention [Bracho Pacheco et al., 2018; Brecher et al., 2018; Giannattasio et al., 2015]. Health education is efficient to the extent that its actions are planned and evaluated precisely and in a standardised manner. It is important to know what knowledge of oral health the paediatricians working in Catalonia have and that they make

		Freq	%
Gender	Female	85	65.89%
	Male	44	34.11%
Type of work	Private centre	43	33.33%
	Public centre	78	60.47%
	Public and private centre	8	6.2%
Experience	< 5 years	25	19.38%
	> 5 years	104	80.62%
They have a paediatric dentistry area	Yes	67	51.94%
	No	62	48.06%

TABLE 1 General characteristics of the surveyed paediatricians.

	Levene's Test for equality of variances		t-Test for equality of means						
	F	Sig.	T	Gf	Bilateral Sig.	Difference in means	Difference in standard error	95% confidence interval of the difference	
								Lower	Higher
Type of Centre	0.411	0.523	2.373	119	0.019	0.971	0.409	0.161	1.781
Experience	1.145	0.287	-0.399	127	0.691	-0.195	0.489	-1.163	0.773
Paediatric dental area	0.315	0.575	-2.014	127	0.046	-0.768	0.381	-1.522	-0.014

F - Leven statistic - Sig. - Statistical significance - T - t-statistic test - Gf - degrees of freedom

TABLE 2 Association of variables and levels of knowledge (Levene's Test).

contributions and learn about the updated protocols of oral health, good habits and action guidelines for the problems that commonly appear in their consulting rooms. This will enable them to advise children affected by oral disorders, carry out better dissemination work in schools and in health promotion sessions in diverse places and settings where members of the community meet [Murphy and Moore, 2018]. The purpose of this work is to analyse the oral health knowledge of paediatricians in Catalonia and report on aspects regarding oral health, good habits and updated action guidelines for the problems that commonly appear in their consulting rooms.

Material and methods

A cross-sectional, descriptive and analytical study was carried out. The population studied consisted of 129 paediatricians in Catalonia who work in public and/or private healthcare. The e-mail addresses were collected of paediatricians in Catalonia who work in children's hospitals connected to the master's

degree in Paediatric Dentistry of the University of Barcelona. Subsequently, an e-mail was sent to the corresponding e-mail addresses, which included the on-line survey designed through the "Google Forms" portal.

The study was done using a survey with 17 multiple choice questions with one correct answer regarding basic knowledge of dentistry. The survey was anonymous and voluntary. Only the researchers of this study had access to the participants' data, which were treated confidentially to preserve their privacy, and their data were protected in accordance with the Organic Law 3/2018, of 5 December, of personal data protection and guarantee of digital rights. Approval was obtained from the Scientific Council of the Paediatric Hospital HM Nens, HM Hospitales, Barcelona.

The survey was divided into two parts. The first gathered the following personal and professional data: age, gender, health centre, experience and whether the centre has a Paediatric Dentistry service. The second had 17 questions on aspects relating to prevention, dental cavities and dental trauma. Once the responses were received, participants were sent an e-mail with a PDF attachment of the correct and reasoned

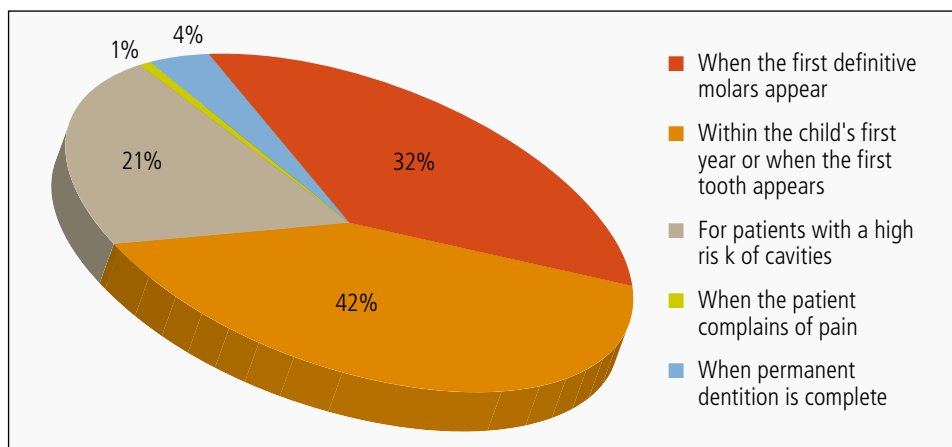


FIG. 1 Pie chart of when professionals recommend a first visit to the paediatric dentist.

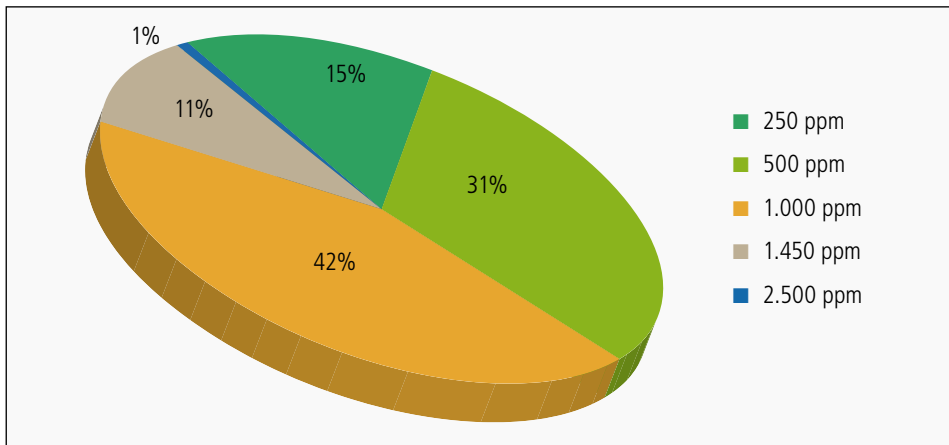


FIG. 2 Pie chart of the amount of recommended fluoride in ppm.

answers for use as a practical daily guide.

The data collection period for the study was November 2019 until September 2020. The criteria for inclusion in the study were participant paediatricians who were actively working, either in a private or public centre, and the surveys were correctly completed and returned within the deadline. Excluded from the study were paediatricians who were not actively working, incomplete surveys and surveys returned after the deadline. Once the responses were obtained, the data was collected on a spreadsheet using Microsoft Excel 2016 from Microsoft Office 365.

The results of the surveys were expressed as absolute values as well as percentages. For comparison purposes, the paediatricians were classified by whether they work in a private or public health centre, their professional experience (<5 years or >5 years) and whether their workplace has a Paediatric Dentistry area or not.

Statistical data analysis was done using the SPSS 25.0 programme, which includes other data analysis tools such as generation of comparative graphics.

Results

The sample comprised 135 surveys to paediatricians in Catalonia. Of the total number of surveys returned, six were discarded for not being within the inclusion criteria (six surveys answered incompletely), a total of 129 surveys were valid for inclusion in the study.

Of the 129 valid surveys, 85 were completed by women and 44 by men and the age range of the study participants was between 28 and 73 years old, with an average age of 45.86 years old and a standard deviation of 10.89.

If the sample is divided by type of centre where the paediatrician works, 60.47% work in a public centre, while 33.33% work in a private centre, 6.20% combine work in both centres. Regarding professional experience, 80.62% of those surveyed have more than 5 years of experience and 19.38% have less than 5 years.

Finally, the workplaces that have a Paediatric Dentistry area from those that do not: More than half of those surveyed (51.94 %) do have such an area available (Table 1).

Regarding the level of knowledge of oral prevention, practically all the paediatricians (86.82%) often carry out an oral exploration during routine visits. However, 8.53% state they do not. The remaining 4.65% do so only when the patient mentions pain.

Regarding when to visit the paediatric dentist for the first time, 41.86% suggest doing it within the child’s first year or when the first tooth appears. On the other hand, 31.78% suggest doing it when the first permanent molars appear; 20.83% of those surveyed recommend visiting the paediatric dentist if the patient has a high risk of tooth decay and 4.65% when the patient has finished losing their deciduous teeth (Fig. 1). Regarding the start of brushing, the highest percent of replies, equivalent to 68.99%, recommend it when the first tooth appears. On the other hand, 10.08% suggest it when the child is the sufficient ability. A minority of the sample (7.75%) advise it after the appearance of the first permanent molar. Regarding the minimum amount of fluoride in parts per million (ppm) that a toothpaste should have from the moment a child starts brushing their teeth, the highest percentage of replies (41.86%) recommended a toothpaste with at least 1,000 ppm of fluoride, followed by 31.01% that supported it having 500 ppm and 14.73% indicated a minimum amount of 250 ppm (Fig. 2).

Referring to traumas, faced with a patient that had suffered a blow to the oral area, but with no apparent sign or symptom, 51.94% would carry out a check-up one week later and 26.36% would refer the patient to the dentist as an emergency, while 8.53% would not take any action. Regarding deciduous teeth, in those cases where the patient has suffered a dental avulsion, 29.46% would suggest to replant the tooth. However, 96.90% would replant the avulsed tooth if it were a permanent tooth.

Upon analysing knowledge based on the replies with the type of centre, it was seen that paediatricians that work in the private sector have greater dentistry knowledge than paediatricians who work in the public sector (p=0.019). Upon making the association according to years of experience, no relationship was observed (p=0.0691). Regarding whether the paediatrician has a paediatric dentistry service in their workplace, it shows that these have greater knowledge (p=0.046) (Table 2).

Discussion

In this study, a sample of 129 valid responses has been used. The main limitation to the study is determined by the complexity of directly accessing all the paediatricians in Catalonia. We have not found a similar study, carried out among paediatricians in Catalonia or of Spain, published in scientific journals indexed in the Journal Citations Report (JCR).

Regarding the oral cavity exploration in a routine visit with the patient, the Protocol of Preventive Actions and Promotion of Paediatric Health of Catalonia recommends early detection of oral disorders as well as promotion of oral hygiene and healthy dietary habits.

In our study, analysing the results of the aforementioned programme, it is observed that the majority (86.8%) of the paediatricians habitually carry dental visits out, while 13.2% of the surveyed professionals only perform them if pain is mentioned. In 2013, the study by Kalkani and Ashley had similar results as 74% of paediatricians surveyed in the United Kingdom carried out oral explorations in routine check-ups of patients [Kalkani and Ashley, 2013]. However, in Germany, the authors Wagner and Heinrich-Weltzien [2014] published an article where almost the entire sample (90%) performed them [Wagner and Heinrich-Weltzien, 2014].

Regarding when it is advisable to visit the paediatric dentist for the first time, 41.9% of those surveyed advise it before the child is one-year-old or with the appearance of the first tooth. However, 31.8% recommend it when the first permanent molars have appeared. This result contrasts with the recommendations of the American Dental Association (ADA), the American Academy of Pediatric Dentists (AAPD) and the American Academy of Pediatrics (AAP) which advise the first visit to the dentist during the first year of life and try to instill health-based prevention habits in families [American Academy of Pediatrics, 2008; Aburahima et al., 2020]. In other words, not just focused on going to the paediatric dentist when there is already an oral issue, such as, for example, tooth decay. In this way, the parents are offered timely guidance on oral hygiene and dietary habits, and a personalised preventive programme can be created [Mika et al., 2018; Bulut and Bulut, 2020].

In the case of oral hygiene of babies, the Spanish Paediatric Dental Society recommends starting to brush from the appearance of the first tooth, doing it twice a day with a toothbrush and using toothpaste with a fluoride content of 1,000 ppm. In the survey, two out of every three paediatricians coincide with the evidence. On the contrary, 10% of professionals recommend doing it when the child has the sufficient ability and 8% from the appearance of the first permanent molar, bearing in mind that this happens at about six years old. Opposite results were obtained in a survey on Indian paediatricians by Indira et al. [2015], in which it was found that 47% of paediatricians surveyed recommend starting to brush when all primary teeth have appeared, while 26% indicate it when the child is one-year-old.

In line with the minimum amount of fluoride that toothpaste should have from the time a child begins to brush their teeth, almost 45% of the professionals surveyed answered that 250 ppm or 500 ppm is a sufficient concentration. On the other hand, 42% of them recommend using a minimum concentration of 1,000 ppm. However, the survey of paediatricians in the United Kingdom by Kalkani and Ashley [2013] shows that only 20.3% of the paediatricians included defend fluoride toothpastes with a concentration equal or greater than 1,000 ppm. Reviewing the literature, Dos Santos et al. [2013] showed that pre-schoolers who brushed their teeth with toothpastes with 1,000–1,500 ppm of fluoride had 31% less decayed surfaces and 16% less decayed teeth when they were compared with pre-schoolers who received a placebo or no intervention. In 2014, a randomised controlled survey evaluated the effect of a conventional fluoride toothpaste (1,100 ppm of fluoride) and another

with low concentration of fluoride (500 ppm of fluoride) on the enamel of deciduous teeth, under exposure to sucrose and accumulation of biofilm. The results suggest that the high availability of fluoride in the biofilm is significantly higher using the conventional toothpaste [Srinivasan et al., 2014]. Based on these findings, it is not appropriate to recommend toothpastes with concentrations lower than 1,000 ppm.

Regarding dental traumas, the common practice of the paediatricians surveyed with a patient who has suffered a blow with no apparent signs or symptoms is to do a check-up one week later. However, the IADT (International Association of Dental Traumatology) recommends referring the patient to the dentist as an emergency because a blow to the oral cavity can have extremely diverse consequences, from minimal damage to the loss of a tooth. Monitoring with an x-ray and possible treatment of dental trauma aims to maintain the permanent tooth as healthy as possible [Day et al., 2020; Levin et al., 2020]. In this case, only 27% of those surveyed answered the question correctly.

In line with the previous question, in the event of an avulsion of a deciduous tooth, 30% of the professionals indicate replantation of the tooth. Scientific evidence supports that the replantation of avulsed deciduous teeth can compromise the development of the underlying permanent teeth. Even so, debate and controversial positions have arisen in the dental literature. While some authors agree in not recommending replantation [Day et al., 2020; Lenzi et al., 2015], others state that this should be considered as an alternative in very specific cases [Rocha and Cardoso, 2008; Martins-Júnior et al., 2014]. In any case, it is important to emphasise that these last cases are based on reports of clinical cases and expert opinions, and not on evaluations with a high level of evidence. For this reason, although occasionally reports are presented on successful cases of deciduous teeth replantation, the risk-benefit to the patient must be evaluated as the replant will affect the development of the permanent tooth [Martins-Júnior et al., 2014; Fouad et al., 2020].

On the other hand, in the field of permanent teeth, faced with a dental avulsion the treatment is to replant it. The objective of the treatment is to prevent or reduce the effects of two major complications: those of the periodontal ligament and those of the dental pulp. The cellular alterations of the periodontal ligament cannot be prevented; however, they can worsen depending on the time and conditions in which the tooth is outside the mouth [Day et al., 2019]. In this case, practically all those surveyed answered the question correctly.

Conclusions

About knowledge and information of the paediatricians surveyed regarding oral prevention, it can be stated that only half of them follow the recommendations of the Paediatric Societies. However, in the section on dental trauma, the professionals mainly follow the recommendations supported by high-quality scientific evidence, being the area of which those surveyed have most knowledge.

Regarding a paediatrician's knowledge according to the type of centre where they work, it resulted that there is a significant difference in knowledge between paediatricians who work in the private sector and those who work in the public sector. Paediatricians who work in a private centre have shown they have greater knowledge.

If we discriminate the workplaces depending on whether

they have a paediatric dentistry area or not, it is statistically proven that the paediatricians in a centre with such an area have greater knowledge.

Finally, knowledge does not relate to the professionals' years of experience, as there are no significant differences between the responses of paediatricians with more or less than five years of experience.

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Conflict of interest

The authors declare they do not have any conflicts of interest.

Author contributions

Janna Morera-Domingo, contributed to conception, design methodology, data acquisition, analysis, and interpretation, drafted the manuscript. Supervision of the Project.

Isabel Maura-Solivellas, contributed to conception, design methodology, data acquisition, analysis, and interpretation, contributed to data analysis and interpretation, critically revised and edited the manuscript. Supervision of the Project.

Josefina Llagostera-Benedico, contributed to conception, design methodology, data acquisition, analysis, and interpretation, drafted the manuscript. Supervision of the Project.

Amalia Arce-Casas, contributed to conception, data acquisition, analysis, and interpretation, critically revised and edited the manuscript. Supervision of the Project.

Carme Valls Sirera, contributed to conception, data acquisition, analysis, and interpretation, critically revised and edited the manuscript. Supervision of the Project.

Elvira Ferrés-Amat, contributed to conception, design methodology, data acquisition, analysis, and interpretation, contributed to data analysis and interpretation, drafted the manuscript and critically revised and edited the manuscript. Supervision of the Project

All authors have read the manuscript and gave final approval and agree to be accountable for all aspects of the work.

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