

Pediatricians' Knowledge, Attitude, and Practice toward Early Childhood Caries in Tunisia

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ABSTRACT

Background: Early Childhood Caries (ECC) constitutes a current worldwide oral health problem and pediatricians, as primary healthcare providers for children, play a critical role not only for children's oral health promotion but also for oral health prevention.

Aims and objectives: To assess the pediatrician's knowledge about ECC and to examine the current preventive oral health-related practices among Tunisian pediatricians.

Materials and methods: The study was designed as a cross-sectional study based on a structured close-ended questionnaire distributed among pediatricians working in private, general, and teaching hospitals selected from four governorates in Tunis, Tunisia. A total of 88 pediatricians participated in the study by filling out the questionnaire which was composed of three main sections; demographic characteristics, assessment of participants' practice, knowledge, attitude about ECC, and assessment of their teaching in oral health during specialty training.

Results: The sample was made up of pediatricians of both genders (73.9% females and 26.1 males), aged between 26 years and 75 years with a mean age of 45.9 ± 1.23 years. About 76% of pediatricians (76%) know ECC, and 71% of them identified bottle-feeding as a risk factor of developing ECC with a higher percentage among private practice pediatricians ($p < 0.05$). The majority of pediatricians (99%) discouraged breastfeeding but only 49% of them advised against bottle-feeding with a higher percentage among pediatricians practising for > 15 years ($p < 0.05$). Although all the pediatricians (98%) believed that they had a considerable role to play in children's oral diseases prevention, only 67% of them reported they had routinely examined the oral cavity of their young patients. A total of 53% rated the oral health content in their medical education as non-existent and deficient and 94% reported that they would like to have more oral health knowledge.

Conclusion: Pediatricians should improve their knowledge of children's oral health, and integrate it more into their daily practice. Oral health information programs should be developed for Tunisian pediatricians and included in Tunisian medical curricula and residency.

Keywords: Attitude, Behavior, Child, Dental caries, Early childhood caries, Knowledge, Pediatrician.

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INTRODUCTION

Early childhood caries (ECC) as defined by the American Academy of Pediatric Dentistry (AAPD) as "the presence of one or more decayed, missing due to caries, or filled tooth surfaces in any primary teeth in children under 6 years of age" constitutes today a real health problem in several countries.¹⁻³

Indeed, this disease can be considered as a problem of public health given its increased prevalence, its impact on the quality of life not only of the children but also of the parents and its role in the inequalities of oral health.^{1,4}

Despite the latest recommendations published by several international associations, insisting that to prevent the development of carious lesions during the early childhood period, children must have a dental examination before the age of 1 year or within 6 months of the first primary tooth eruption, several studies have shown that children under the age of three rarely or never see a dentist for regular check-ups, in contrast, due to the need to consult pediatricians at this age, children are more likely to see a pediatrician than a dentist.^{1,3,5-7}

Pediatricians, considered as the first healthcare providers consulted by young children, have the opportunity to contribute not only to the overall health but also to the oral health of their patients by improving their knowledge of the prevention of oral diseases and oral health and systematically incorporating it into their daily routine.⁸

The current study aimed to assess Tunisian pediatricians' knowledge, attitude, and practice toward ECC in the governorate of Tunis, Tunisia.

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MATERIALS AND METHODS

The survey was designed as a cross-sectional study undertaken among pediatricians working in Tunis, Tunisia, selected from four governorates: Ariana, Ben-Arous, Manouba, and Tunis.

The list and addresses of pediatricians were obtained from the Tunisian Society of Pediatricians and data acquisition was performed between January and April 2019 through a self-administered questionnaire.

Pediatricians working in private, general, and teaching hospitals were contacted after obtaining their consent. A total of 116 pediatricians were contacted, but only 88 of them agreed to participate and returned a well-filled questionnaire.

The questionnaire used in the present study was divided into five sections and comprised a total of 41 questions pertaining to sociodemographic, knowledge regarding ECC risk factors, attitude toward its prevention, practice guidelines, and opinions. The queries about the sociodemographic details included questions on age, gender, number of years in clinical practice, place, and type of practice.

The knowledge was determined based on questions about ECC and its major risk factors. The attitude toward the prevention of ECC was assessed based on questions about the pediatrician's role in promoting oral health, parent's education, and counseling in the prevention of ECC during child care.

Pediatricians' practice assessment was depending on the response to queries on parents' dental counseling, diet analysis, inquiry about bottle-feeding, breastfeeding, the examination of the child's teeth, and the importance of toothbrushing. Pediatricians were asked about their teaching in oral health during specialty training, the main sources of their knowledge about oral diseases, and their need for further education about oral health prevention. The practice and knowledge sections contained dichotomized responses (yes or no), while for the attitude section the responses for each item were from a three-point Likert scale (agree, disagree, not sure). Before filling out the questionnaire, participants who agreed to answer the questions signed a consent form. Since the questionnaire was anonymous, confidentiality was protected.

The questionnaire was distributed in French and to obtain the greatest number of responses, the form was distributed in two different formats; hard copies distributed to hospitals and an electronic copy distributed online using "Google Forms" sent to private practices.

According to the response rates, scores were assigned to each question belonging to the different parts of the questionnaire. The scores are assessed as follow: poor <50%, moderate 50–75%, and good >75%. The results obtained were analyzed using Statistical Package for Social Science IBM SPSS version 24 for Windows. Statistical analyzes included frequency distribution. Chi-square test was used to determine the influence of sociodemographic factors on pediatricians' knowledge, attitude, and practice in relation to ECC, and a *p* value of 0.05 and less was considered as significant.

RESULTS

A total of 88 pediatricians agreed and participated in the present study. The sample was made up of pediatricians of both genders (73.9% females and 26.1% males), aged between 26 years and 75 years with a mean age of 45.9 ± 1.23 years (Table 1).

Pediatricians' Knowledge about ECC (Table 2)

The majority of pediatricians (76%) know ECC, and 71% of them identified bottle-feeding as a risk factor with a higher percentage among pediatricians in private practice (*p* = 0.040). However, 89.8% of pediatricians did not identify overnight breastfeeding as an ECC risk factor.

Poor oral hygiene and inadequate toothbrushing were also identified as risks of ECC developing for 93.4% of the participants.

Table 1: Personal details of respondents

Characteristic	N	%
Gender		
Male	23	26.1
Female	65	73.9
Age group (years)		
20–30	8	9.1
31–40	27	30.7
41–50	22	25
51–60	19	21.6
>60	12	13.6
Year in practice		
0–5	16	18.2
6–10	16	18.2
11–15	10	11.4
16–20	8	9.1
21–25	16	18.2
26–30	9	10.2
31–35	8	9.1
>35	5	5.6
Practice place (governorate)		
Ariana	14	15.9
Ben Arous	11	12.5
La Manouba	2	2.3
Tunis	61	69.3
Practice setting		
Private	45	51.1
General hospital	17	19.3
Teaching	26	29.5

Table 2: Pediatricians' knowledge of risk factors associated with ECC

	Yes, N (%)	No, N (%)
Knowledge of early childhood caries	67 (76)	21 (24)
Bottle-feeding at night	63 (71)	25 (29)
Sweet milk	80 (91)	8 (09)
Overnight breastfeeding*	9 (10.2)	79 (89.8)
Oral hygiene*	83 (94.3)	5 (5.7)
Tooth brushing*	83 (94.3)	5 (5.7)
Family tendency	2 (2.3)	86 (97.7)
Non-nutritive sucking habits	56 (63)	32 (37)

*Known risk factors for dental caries

Pediatricians' Attitudes toward ECC (Table 3)

The majority of pediatricians (94.3%) reported that oral hygiene could prevent the development of dental caries but only 43.2% of them recognized routine dental visits as an important way to prevent oral diseases.

All the pediatricians (98%) recognized that they have a role in the prevention of young children's oral diseases and 81% reported that they should be able to identify carious lesions.

Pediatricians' Practice toward ECC (Table 4)

Only 67% of the respondents reported routinely examining the oral cavity of their young patients and a low percentage of pediatricians

Table 3: Pediatricians' attitudes toward ECC

	<i>Agree, N (%)</i>	<i>Disagree, N (%)</i>	<i>Uncertain, N (%)</i>
Early childhood caries may be prevented	81 (92)	7 (8)	0 (0)
Oral hygiene is important in preventing dental caries	83 (94.3)	5 (5.7)	0 (0)
Routine dental visits are important in oral diseases prevention	38 (43.2)	50 (56.8)	0 (0)
A pediatrician has an important role in promoting oral health	86 (98)	2 (2)	0 (0)
A pediatrician should examine their patient's mouth	87 (99)	1 (1)	0 (0)
A pediatrician should be able to identify dental caries	71 (81)	17 (19)	0 (0)
A pediatrician should be able to identify dental plaque	71 (81)	17 (19)	0 (0)
A pediatrician should inform parents and patients of the relationship between overnight feeding and dental caries	43 (49)	45 (51)	0 (0)
A pediatrician should inform parents and patients of the relationship between breastfeeding and oral health	9 (10.2)	74 (84.1)	5 (5.7)
A pediatrician should inform parents and patients of the relationship between their child's diet and dental caries	79 (89.7)	6 (7)	3 (3.3)
A pediatrician should inform parents and patients on toothbrushing	59 (67)	29 (33)	0 (0)

Table 4: Pediatricians' behavior and practice toward ECC

	<i>Yes, N (%)</i>	<i>No, N (%)</i>
(A)		
Perform oral examination	59 (67)	29 (33)
Perform dietary habits assessment on their patients	82 (93)	6 (7)
Recommend routine oral health examination	28 (32)	60 (68)
Recommend first dental visit between 6 months and 1 year	28 (32)	60 (68)
Recommend oral hygiene	54 (61)	34 (39)
Advice parents to brush their children's teeth	41 (46)	47 (54)
Advice parents about the use of fluoridated toothpaste	60 (68)	28 (32)
Advice parents about topical application of fluoride	46 (52)	42 (48)
Advice parents about other ways of fluoride administration	7 (8)	81 (92)
Recommend breastfeeding	87 (99)	1 (1)
Discommmend overnight bottle-feeding	43 (49)	45 (51)
	<i>N</i>	<i>%</i>
(B)		
Age children should be weaned off breastfeeding		
6 months	4	4.5
1 year	8	9.1
1.5 years	35	39.8
2 years	40	45.5
2.5 years	1	1.1
Age children should be able to brush alone his teeth		
3 years	0	0
4 years	2	2
5 years	4	4
6 years	22	25
>6 years	60	69
Provide educational materials to parents		
Never	2	2.3
Rarely	21	23.9
Sometimes	17	20
Often	23	26.6
Always	24	27.3

with academic affiliation (18.6%) comparing to those in private practice who perform oral examination regularly (64.5%) ($p = 0.043$). Also, only 32% of the pediatricians recommended a routine dental visit to their patients. Comparing with females (23%), 56.6% of male participants recommend routine dental visits ($p = 0.003$).

Most pediatricians (99%) recommended breastfeeding but only 49% discouraged bottle-feeding with a greater percentage of pediatricians with 15 years of experience ($p = 0.007$).

Results of this study showed that only 46% of pediatricians advised parents to brush their children's teeth and participants in the age group 31–40 years old insisted more on parents to brush the teeth of their children ($p = 0.024$). There was a statistically significant difference between age groups and professional experience in prescribing fluoride. Pediatricians in the age group of 51–60 years old are more used to prescribe fluoride ($p = 0.010$). Results revealed also that 81.5% of female pediatricians never prescribed fluoride compared to 52% of male pediatricians ($p = 0.016$). Diet counseling was provided by 93% of respondents and pediatricians in the age group of 41–50 years old educated always their patients about the prevention of teeth decay ($p = 0.008$).

About 98% of pediatricians agreed to have an important role in promoting oral health and confirmed that assessment of dental caries should be a part of routine child care.

Training and Sources of Information (Table 5)

About 53% of the pediatricians confirmed that they received deficient education on children's oral health during their medical school training and about 94% of them reported that they want more education and training.

DISCUSSION

The main objective of the present study was to assess the knowledge, attitudes, and practice, of a sample of Tunisian pediatricians, regarding the oral health of their young patients.

Although most participants (63.6%) have been practising for more than ten years, which reflects a good level of professional experience, the results showed that some pediatricians had a good knowledge of certain etiological factors of ECC, and less knowledgeable about some other factors, such as, family tendency and overnight breastfeeding.

Table 5: Pediatricians' training and sources of information

	N	%
Did you receive teaching in oral health during specialty training?		
Yes	41	47
No	47	53
Main sources of your knowledge about oral health		
Specialty training	16	18
Media/internet	18	20
Medical journals	20	22
Conferences and congresses	8	10
Discussion with a dentist	26	30
Do you need further information about the prevention of oral diseases?		
Yes	83	94
No	5	6
Total	88	100

The present survey showed that 76% of pediatricians know ECC, and 93.4% of them reported that good oral hygiene and adequate toothbrushing can prevent it.

About 71% of the pediatricians identified bottle-feeding as a risk factor of developing ECC but only 49% of them discommend bottle-feeding with a higher percentage among pediatricians practising for over 15 years ($p = 0.007$).

The same results were reported by Prakash et al.⁹ and Nassif et al.¹⁰ confirming that this lack of knowledge might be because most pediatricians believed that breast-milk does not cause dental caries.¹⁰

Indeed, breastfeeding has always been considered as the most appropriate and beneficial feeding method for infants, but nocturnal breastfeeding, at will-breast feeding, as well as weaning delayed beyond the age of 2 years or more could increase the prevalence of carious lesions similar and this also applies to bottle-feeding.^{10,11}

The American Academy of Pediatricians (AAP) guidelines suggest that pediatricians have to advise their patients' parents to begin bottle and/or breast weaning at approximately 9 months of age and accomplish it just after 12 months but the majority of pediatricians designated an approximate age of 2 years for breast weaning.¹² Moreover, 84% of the pediatricians did not believe that overnight breastfeeding is a risk factor of ECC.

These results showed that although pediatricians advise parents on the methods and duration of breastfeeding, they do not always follow the new international guidelines published recently.^{9,13–17}

Also according to the latest international recommendations, children cannot brush their teeth properly and can only acquire this skill without parental assistance until around the age of 8 years or more, i.e., when they learn to hold a pen properly.³

In the present survey, about 46% of pediatricians report informing parents about the importance of toothbrushing in preventing dental disease; and participants aged between 31 years and 40 years old insisted more on parents brushing their children's teeth ($p = 0.024$). These results similar to those found in the research done by Nassif et al.¹⁰ can be elucidated by the fact that young pediatricians who have recently graduated have a better ability to recall information taught during medical school years and by the fact that they are more likely to use evidence-based research.

Most of the participants were aware of the importance of water fluoridation, fluoride, and fluorosis in Tunisian communities, but only 8% of the pediatricians agreed with AAP recommendations which were the pediatrician's obligation to prescribe fluoride.

Since the amount of fluoride content in the drinking water is very important in Tunisia, about 25% of Tunisians have a potential dental fluorosis risk¹⁸ and the dental fluorosis constitutes a public health problem in several Tunisian regions,¹⁹ the fluoride supplementation is no longer recommended in Tunisia. This finding in accordance with Sabbagh et al.'s study²⁰ which was carried out in Saudi Arabia demonstrates that pediatricians are also aware of this problem.

Caries disease is a complex multifactorial infectious disease involving the instantaneous interaction between several factors. But to prevent the onset of this disease especially during the early childhood period, educating parents in good nutrition and good oral hygiene practice is one of the essential measures that can be taken.

As such, it was very encouraging to find that 89.7% of Tunisian pediatricians, inform, and educate parents and kids about the importance of the child's diet on oral health.

Similar to those of Ramroop et al.'s study,¹ the majority of pediatricians (93%) actually performed a dietary habits assessment of their patients.

Early visits to the dentist or a pediatric dentist may allow early diagnosis or prevent the appearance of caries lesions in children.

According to the AAPD, to promote the oral health of infants and children and to prevent the onset of dental caries, an early dental examination should be performed for each child from an early age.⁷

Therefore, pediatricians must recognize their important role especially in promoting the oral health of their young patients since these children encountered pediatricians more often than dentists.

However, in this study, only 32% of pediatricians recommended for their patients a first dental visit between the age of 6 months and 1 year.

In Trinidad and Tobago, a similar finding was reported by Ramroop et al.¹ where only 28.6% of the participants recommended first dental visits by the age of 1 year.

Such results were also described in a survey performed in the USA, where only 17% of pediatricians recommended to their patients a first dental visit before the age of 1 year, while 50% of them presumed that the first dental visit should not occur before the age 3 years old.²¹

Contrary to findings described in a study in the United States, where approximately 98.9% of pediatricians frequently examined their patients' teeth for dental caries, in this study only 67% of pediatricians reported regularly examining the oral cavity of their patients.²²

The result of the present survey was considered as disappointing as it was lower than that reported in other studies (87–100%).^{4,15,17} Indeed, a low percentage of pediatricians with academic affiliation (18.6%) comparing to those in private practice (64.5%) perform oral examination regularly ($p = 0.043$).

This can be explained by the obstacles encountered by pediatricians in their daily practice. Indeed, there are several obstacles to the involvement of pediatricians in this procedure, among these obstacles we find the lack of time during appointments and the lack of perceived need by parents for dental care, these two obstacles were the most reported by many authors in numerous studies.^{9,23,24}

The most disconcerting results of the present study, as demonstrated in Balaban et al.'s study²⁵ and Prakash et al.'s study⁹ was with regard to the quality of oral health courses during the medical curricula.

About 53% of the pediatricians classified the oral health courses during their residency in medical school as deficient.

As reported in a previous study, 94 of the pediatricians reported that they would like to learn more and have more informations about oral health.^{9,23,25}

Medical schools should provide their medical students with training in oral health so that they acquire basic knowledge and positive attitudes regarding oral health promotion and prevention. This may be possible through an interdisciplinary program allowing future physicians a commitment to the overall health of patients.²⁵

Furthermore, seminars, workshops, and continuous training on children's oral health should be organized. Another suggested

solution is to encourage the collaboration between the medical and the dental community by organizing more scientific meetings between them.²⁶

Most of the surveyed pediatricians^{9,23,25} reported feeling that their knowledge regarding oral diseases was insufficient.

This finding demonstrates that it is important to publish articles in oral health intended for physicians, health professionals in a different setting and these topics can also be included in medical courses. Specific oral health protocols, intended to promote oral health, easy to read, adapted to the training of pediatricians must be published to guide them in their daily practice.^{7,26}

Recommendations

The obtained results suggested certain improvements:

Improvement of the collaboration between Tunisian pediatric dentists and Tunisian pediatricians for the implementation of the oral health education programs.

Promotion of the oral examination of neonates by the Tunisian pediatric dentist soon after birth (during the first year of life).

Incorporation of oral health into Tunisian pediatricians training.

CONCLUSION

Pediatricians can play an important role in the promotion and prevention of caries disease in children and infants. These doctors, the first to be seen by children, can help improve not only the general health but also the oral health of children.

The collaboration of pediatricians with various professionals in different contexts having contact with children during the early childhood period is mandatory to improve oral health and reduce the prevalence of caries development in children.

It is essential that other professionals responsible for the health of children, such as, family physicians and nurse-practitioners, incorporate oral health not only into their training but also in their daily practice.

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