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AWARENESS, CURRENT PRACTICES AND CHALLENGES REGARDING CHILDREN ORAL HEALTH AMONG PEDIATRICIANS IN EGYPT

Rabab K. ElGhandour*, Ghada M. Mahmoud**, Mohammed A. Bayoumi*** *and* Rehab Samir Salma**

ABSTRACT

Introduction: Awareness of pediatricians of the etiology, risk factors and consequences of ECC makes timely referrals and intervention possible, significantly improving the oral health, general health and quality of life. This study aims to assess the awareness of Egyptian pediatricians regarding children oral health, their current practices and challenges to integrating oral health into routine practice.

Methods: A questionnaire addressing pediatricians' characteristics, knowledge of children oral health and how often they perform oral health related practices was distributed. Appropriate statistical methods were used for data analysis.

Results: 260 pediatricians; Knowledge deficits were noted about ECC consequences (80.8%), first dental visit (73.1%), nocturnal/at will weaning (75%), impact of feeding practices (80.8%), tooth brushing initiation (81.5%). While 50% recognized the need for oral health assessment; 77.3% discourage sweetened beverages; 72.3% discuss oral hygiene; 83.8% assess oral health; 77.7% encourage scheduled feeding; 63.8% address importance of healthy diet for oral health, 75.4% refer to dentists; only 4.6% discuss bacterial transmission. Reported challenges included lack of time (44.6%); limited knowledge (23.1%); insufficient resources (33.1%) and communication barriers (11.5%)

Conclusions: There is considerable room for enhancing oral health education and training of pediatricians to support effective ECC prevention and improve child health outcomes.

Clinical significance: This study highlights the crucial role pediatricians play in early detection and prevention of childhood oral diseases. Enhancing their awareness and practices can lead to timely referrals, reduced oral health disparities, and improved overall health outcomes in children, emphasizing the need for integrated oral health education in pediatric medical training.

KEYWORDS: Oral health, Pediatricians, Early childhood caries, Primary health care providers

* Lecturer of Pediatric Dentistry, Department of Pediatric Dentistry, Faculty of Dentistry, Pharos University in Alexandria
** Associate Professor of Pediatric Dentistry, Pediatric Dentistry Department, College of Dentistry Elalamein, AAST
*** Consultant of Pediatric Dentistry, Maghrabi Dental Center, Al Madina Almunawarah, Saudi Arabia

INTRODUCTION

Oral health of an individual is an integral part of the general health which is especially true in infants and children. Dr. Benjamin RM referred to oral health as the silent epidemic; the effects of compromised oral health in infancy/childhood almost always extend into adulthood [1].

Early childhood caries (ECC), for instance, is the most common chronic disease affecting children where 60-90% of children over the world are affected. It is a disease of multifactorial foundation and a virulent nature. Delayed diagnosis and intervention of ECC lead to rapid advancement of the disease which compromises the child's well-being, ability to eat, sleep patterns, growth, development, appearance, speech, self-esteem, all of which, negatively influences the oral health related quality of life of children and their families and represents a financial burden both on the individual and the governmental levels [2, 3]. The situation is worst in developing countries where oral health awareness is scarce and access to dental care remains challenging [4].

Despite the recommendations of commencing dental visits by a maximum of 12 months of age, it is extremely common that caregivers don't take their child to the dentist unless there is an urging situation. On the other hand, pediatricians are the first to encounter newborns and their parents and this often occurs on a regular or at least frequent basis [5].

Over the past decades, attention has been drawn to the potential valuable role of pediatricians in children's oral health. Not only should pediatricians be able to educate caregivers about the importance of oral hygiene implementation at a young age, appropriate feeding habits and caries development and its risk factors, but they should also recognize the presence of caries or abnormal oral habits and refer to a dentist [6]. However, it continues to be noticed that pediatricians do not give much consideration to oral health, and very often neglect referring the children/caregivers to the dentist.

Collaboration with pediatricians and making them aware of the etiology, risk factors and consequences of dental conditions makes timely referrals and intervention possible which in turn, significantly improves the oral health, general health and quality of life. Based on this concept and aligning with the recommendations of Garrocho-Rangel et al.[7] in their systematic review to periodically assess the status of awareness of pediatricians regarding the oral health of children, this study aimed to assess the awareness level of a sample of Egyptian pediatricians regarding the oral health of children, their current practices and the challenges to integrating oral health into their routine practice.

MATERIALS AND METHODS

This study is a descriptive cross-sectional study that was conducted at the pediatric dentistry department, College of Dentistry ElAlamein, Arab Academy for Science, Technology, and Maritime Transport (AAST). This was accomplished after receiving ethical approval from the Research Ethics Committee AAST, #1240.016.24.REC in adherence to the principles of the Declaration of Helsinki 1964 and its later amendments. It was directed to assess the oral health awareness of pediatricians over five cites in Egypt through a questionnaire that was distributed either electronically or in printed form. Participants were practicing pediatricians working at university hospitals, ministry of health, health insurance organization hospitals, private clinics and/or private hospitals. Participants received explanation about the purpose of the study. Those who were willing to participate, provided their consent and were informed that participating is anonymous. Sample size estimation was determined by online calculator with 80% confidence level and 5% margin of error and the minimum required sample size was determined to be 256 participants. The study was designed and carried out from September to December 2024 with the total number of participants 260. The questionnaire was

developed based on previously published study [8]. To evaluate its content validity, a content validation form was provided to nine dental academics. They were asked to assess the relevance of each item using a 4-point ordinal scale: (1) not relevant, (2) somewhat relevant, (3) quite relevant, and (4) highly relevant. The content validity index at the item level (CVI-I) was determined by dividing the number of experts who rated an item as 3 or 4 by the total number of experts. An overall CVI-I score of 0.91 was achieved, indicating acceptable validity [9]. The Cronbach's alpha coefficient was used to assess the questionnaire's reliability in terms of internal consistency. An acceptable Cronbach's alpha value of 0.72 – 0.78 was discovered.

It consisted of four sections and 21 close-ended questions. The first section was addressing the characteristics of pediatricians included in the study: years of practice, working place and if ever received formal education or training in oral health. The second section is concerned with their knowledge of oral health problems: Early childhood caries, timing of child's first dental visit, importance of using fluoride, oral hygiene practices, effect of sugary diet on the teeth, effect of habits on oral development and their role of conducting a comprehensive oral health assessment at each well-child visit. A 5-Likert scale was used for responses on this section; strongly agree to strongly disagree. The third section was concerned about how often they perform the oral health related practices during routine pediatric care visits; (responses ranged from always, sometimes, when needed and never): asking about oral hygiene habits, assessing the oral health, counseling parents about oral hygiene practices, providing anticipatory guidance about the development of teeth and referral to dentist for prevention or treatment. The fourth section measured the extent of difficulty to integrate oral health into pediatric care practice (responses ranged from high, moderate and low difficulty): lack of time, limited knowledge, lack of access and difficulty in communication with parents.

Statistical analysis

Descriptive statistics were employed where all data were presented using frequency and percentages. Responses to the second section were summed to: Acknowledged (strongly agreed and agreed), Not acknowledged (neutral, disagreed and strongly disagreed). Responses to third section were summed to: Always, Not usual practice/never (sometimes, when needed, never). The Pearson Chi square test was used to assess differences between responses with significance level set to be <0.05. Pairwise comparisons were employed for comparison between difficulty levels in integrating oral health into pediatric care practice with Bonferroni correction adjustment to avoid type I error. Data was analyzed using IBM SPSS version 23 for windows, Armonk, NY. USA.

RESULTS

The sample consisted of 260 practicing pediatricians with a response rate of 100%. Their practice setting, years of practice and status of having received formal education/training regarding oral health of children are described in table 1.

TABLE (1) Characteristics of pediatricians included in the study

Characteristics	Total sample n = 260
How many years have you been practicing in pediatric care?	
Mean ± SD	16.22 ± 6.67
Min – Max	0.25 – 23.0
Median (IQR)	2.0 (2.0 – 5.0)
What type of practice setting do you work in? n (%)	
Ministry of health, health insurance organization hospitals	200 (76.9%)
Private clinics/ hospitals	50 (19.2%)
University hospitals	10 (3.8%)
Have you received any formal education or training in children oral health? n (%)	
No	230 (88.5%)
Yes	30 (11.5%)

Table 2 shows knowledge among pediatricians on key concepts regarding oral health of children; 19.2% recognized that ECC has drastic consequences on overall health; 26.9% were aware that infants should have their first dental visit by 12 months of age; 25% understood that nocturnal/ at will feeding should be stopped by the eruption of the first tooth; 19.2% approved that both breast and formula feedings (at will) would lead to ECC; 38.4% agreed that tooth brushing should start by the eruption of first tooth; 18.5% knew that brushing with a fluoride toothpaste twice a day is essential for good oral hygiene; 77.3% saw that frequent consumption of sweetened beverages in baby bottles or no-spill cups should be avoided; 50% appreciated that children should have a comprehensive oral health assessment at each routine appointment.

Table 3 highlights pediatricians' frequency of performing oral health-related practices during routine appointments; 72.3% of pediatricians reported asking parents about their children's oral hygiene habits; 83.8% reported assessing oral health for signs of decay or gum disease; 77.7% implement regular feeding schedule for infants; 63.8% stated that they always discuss the importance of a healthy diet for oral health; only 4.6% discussed the role of horizontal and vertical transmission in development of ECC; 75.4% stated that they always refer children to a dentist for prevention & treatment.

Table 4 highlights the extent to which various factors challenge the integration of oral health into routine appointments. The greatest difficulty reported was lack of time, with 44.6% perceiving it as a high difficulty. Limited knowledge or confidence was also a significant barrier, rated as a high/ moderate difficulty by 23.1% and 68.5% of pediatricians, respectively. Lack of access to oral health resources or referral pathways was referred to as a high/ moderate difficulty by 33.1%, and 40%, respectively. In contrast, difficulty in communicating with parents posed the least challenge, with only 11.5% rating it as high difficulty.

TABLE (2) Pediatricians' answers to oral health related knowledge questions

	Knowledge Items	Acknowledged		Not acknowledged		p value
		n	%	n	%	
1	Early childhood caries (ECC) has drastic consequences on overall health	50	19.2	210	80.8	<0.001*
2	Infants should have their first dental visit maximum by 12 months of age	70	26.9	190	73.1	<0.001*
3	Nocturnal and at will feeding should be stopped by the eruption of the first tooth	65	25	195	75	<0.001*
4	Both breast and formula feedings (at will) would lead to early childhood caries	50	19.2	210	80.8	<0.001*
5	Tooth brushing should start by the eruption of first tooth	100	38.4	160	61.5	<0.001*
6	Brushing with a fluoride toothpaste twice a day is essential for good oral hygiene	48	18.5	212	81.5	0.0001*
7	Frequent consumption of sweetened beverages in baby bottles or no-spill cups should be avoided	201	77.3	59	22.7	<0.001*
8	Children should have a comprehensive oral health assessment at each routine appointment	130	50	130	50	1.00

Statistically significant differences at p value<0.05

TABLE (3) Pediatricians' answers indicating how often they perform oral health related practices during routine appointments

	Practices Items	Always		Not usual practice/Never		p value
		n	%	n	%	
1	Ask parents about their child's oral hygiene habits (brushing, flossing & fluoride use)	188	72.3	72	27.7	<0.001*
2	Assess the child's oral health for signs of decay, gum disease, or other problems	218	83.8	42	16.2	<0.001*
3	Implement regular feeding schedule for infants	202	77.7	58	22.3	<0.001*
4	Discuss the importance of a healthy diet for oral health	166	63.8	94	36.2	<0.001*
5	Discuss the role of horizontal and vertical transmission in development of ECC	12	4.6%	248	95.4%	<0.0001*
6	Refer children to a dentist for preventive care and treatment	196	75.4	64	24.6	<0.001*

Statistically significant differences at p value<0.05

TABLE (4) Pediatricians' answers regarding challenges to integrating oral health into routine appointments

	Challenges Items	Low difficulty		Moderate difficulty		High difficulty		P value
		n	%	n	%	n	%	
1	Lack of time during routine appointments	40[a]	15.4	104[b]	40	116[b]	44.6	<0.001*
2	Limited knowledge or confidence in addressing oral health concerns	22[a]	8.5	178[b]	68.5	60[c]	23.1	<0.001*
3	Lack of access to oral health resources or referral pathways	70[a]	26.9	104[b]	40	86[ab]	33.1	0.022*
4	Difficulty communicating effectively with parents about oral health	136[a]	52.3	94[b]	36.2	30[c]	11.5	<0.001*

Statistically significant differences at p value<0.05, Different superscript lowercase letters denote statistically significant difference between responses

DISCUSSION

Early childhood caries (ECC) remains a global pandemic with widespread prevalence. It has been proven to significantly affect the quality of life of affected children and their families [(10)]. Among the World Health Organization (WHO) recommendations for preventing of oral diseases is educating pediatricians to detect oral diseases and provide referrals [(11)]. The present study aimed to assess the awareness level of a sample of Egyptian pediatricians regarding the oral health of children, their current practices and the challenges to integrating oral health into their routine practice.

In the current study, 88.5% of pediatricians reported to not having received any formal education or training on oral health. Likewise, Khater and Moussa [(12)], Gupta et al. [(13)], and Nammalwar et al. [(14)], noted that pediatricians and primary health care providers did not receive any forms of dental training.

The results of the current study revealed limited knowledge of most pediatricians in the sample regarding key elements related to oral health of children with the exception of frequent consumption of sweetened beverages in baby bottles or no-spill cups where it seemed obvious to the majority of pediatricians (77.3%) that it should be avoided. This coincides with the results of previous studies where pediatricians showed poor general knowledge regarding oral health aspects [15-17].

Most of pediatricians in our sample were not aware that ECC had drastic effects on the overall health (80.8%), unlike what was reported in Canada by Singhal et al. [18], where almost all their sample knew that ignored dental decay affects the general heath of children. This discrepancy may be attributed to the fact that Canada is a developed country, in contrast to our own setting. This highlights the substantial gap between developed and developing countries in terms of awareness regarding ECC.

Seventy three percent of our surveyed pediatricians did not know that infants should have their first dental visit by the age of 12 months. This percentage is comparable to what was reported by Nammalwar et al. [14] and Hadjipanayis et al. [8], where the latter justified this that dentists in their area refuse to receive patients under the age of 3.

A high percentage of pediatricians in our sample did not approve that nocturnal/at will nursing should be stopped as soon as the first tooth erupts (75%) nor were they aware that both breast and formula feedings would lead to ECC ((80.8%). Given that breastfeeding is a natural and beneficial practice, it is often perceived by caregivers as harmless and unlikely to contribute to dental decay, unlike formula feeding or other alternatives.

Moreover, 81.5% of pediatricians did not see the necessity of brushing twice daily with fluoridated toothpaste aligning with previous studies [19, 20] which reported lack of knowledge of pediatricians about the importance of fluoride and its role in preventing ECC. Such reported findings were different from a Canadian study by Singhal et al. [18] in which 77% of family physicians appreciated the importance of topical fluoride for caries prevention in children. This was also seen by Farsi and Alagili in 2023 [21] where (95%) of their sample had the same knowledge.

In contrast, the results of our study revealed that pediatricians in our sample did perform oral health related practices during routine checkups, where most of them discussed with parents oral hygiene habits (72.3%), examined the oral cavity for any abnormalities(83.8%), implemented a regular feeding schedule for infants (77.7%), emphasized the importance of a healthy diet (63.8%) and referred children for a dentist for either prevention or treatment. (75.4%). Such findings coincide with those reported with Sores et al. [22] and Quinonez et al. [23] where the majority of pediatricians in their studies always perform an oral examination during routine visits.

Nevertheless, a minority of pediatricians in the present study discussed the role of vertical and horizontal transmission in development of ECC (4.6%) reflecting scarcity in the basic knowledge of etiological factors of ECC.

In the present study, pediatricians reported moderate to high levels of difficulty in integrating oral health into routine appointments. Among the barriers identified; lack of time with 40% of respondents rating it as a moderate difficulty and 44.6% as a high difficulty; In the same manner, several studies also reported the lack of time [18, 20, 24, 25] was a major obstacle in the way of providing proper oral care.

Limited knowledge/confidence in addressing oral health concerns was particularly challenging in the current study where 68.5% and 23.1% rated it as moderate and high difficulty, respectively; lack of access to oral health resources represented a challenge to 77.1% of pediatricians. On the other hand, more than half of the pediatricians did not find difficulty in communicating with parents about oral health. On the contrary, other studies indicated that fear that parents would

refuse their recommendation represented a challenge [18, 21, 26]. Pediatricians surveyed in this study also agreed that primary health care providers can play a significant role in preventing oral diseases in children (73.1%) and that children should have a comprehensive oral health assessment at each well-child visit (80.8%). This is consistent with the findings of several studies [8, 18, 21, 24, 27,28] creating a promising path for establishing the role of pediatricians and pediatric subspecialties in preventing oral diseases taking in consideration the availability of the needed knowledge and facilities.

LIMITATIONS

Among the limitations of the study was the limited number of pediatricians included which did not cover all geographic locations in Egypt coming from different backgrounds and working under diverse circumstances, therefore the results cannot be generalized to the whole pediatrician population in Egypt. Moreover, the study relied on self-reported data, which is subject to social desirability. Pediatricians may have overreported favorable attitudes or knowledge levels.

Conclusion and recommendations

In the light of the study findings and within its limitations, it can be concluded that there is considerable room for improvement in the oral health education of pediatricians. Despite their crucial role in early childhood healthcare, many pediatricians may lack adequate training and awareness regarding ECC, its risk factors, and the principles of primary prevention. To address this gap, we recommend the development of official, interdisciplinary educational programs aimed at equipping pediatricians with essential oral health knowledge and preventive strategies integrated into both undergraduate and continuing medical education curricula. Additionally, the establishment of efficient and streamlined referral systems between pediatricians and pediatric dentists is essential in supporting timely communication and coordinated care to ensure early intervention and improved outcomes. Public health authorities, academic institutions, and professional bodies are encouraged to collaborate in creating national policies and clinical guidelines that emphasize the integration of oral health into pediatric care frameworks.

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