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Evaluation Of Knowledge And Practice Of Pediatricians About Early Childhood Caries In Tehran, Iran

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ABSTRACT

Introduction: Despite efforts for improvement of oral health in the world during recent years, dental caries remained one of the most common chronic diseases in the childhood. One of the most important factors that can play a significant role in the success of oral health promotion programs is the adherence and collaboration of non dental staff of pediatric health providers such as pediatricians. The present study aimed to evaluate pediatricians' knowledge and practice regarding oral health and its related factors.

Materials and Methods: In this cross-sectional descriptive-analytical study conducted in 2020, 90 pediatricians that were working in Tehran city participated. A newly designed valid and reliable questionnaire comprised of three sections of demographics (8 questions), knowledge (30 questions) and practice (8 questions) was provided to the participants. The knowledge questions consisted of five domains about primary teeth (8 questions), dental visits (3 questions), dental caries determinants (8 questions), eating habits (7 questions), and fluoride (4 questions). Data analysis was performed using SPSS software version 22. The significance level was considered to be less than 0.05 ($p<0.05$).

Results: The participants (n=90) had an average age of 45.96±9.75 years (ranged 30-76 years) and 60 percent of them were women. The mean of their knowledge score was 20.10±4.45 (out of a maximum 30) and for the practice, it was 15.51±3.49 (out of a maximum 24). Receiving oral health training courses during education period was significantly associated with the higher knowledge of the physicians (r=0.20, p=0.04). Furthermore, interest in learning (r=0.20, p=0.04) and presence of dentists among their relatives and friends (r=0.21, p=0.03) were significantly related to better oral health practice of the studied pediatricians. There was no difference in pediatricians' knowledge and practice according to age and gender.

Conclusion: In general, the knowledge and practice of pediatricians about oral health and prevention of dental caries for their patients was not satisfactory. The associations between higher knowledge and practice with recieving the oral health training courses during education period, interest in learning and other motivations such as presence of a dentist among relatives, casts light on the importance of training such professional health staff to promote oral health in the childhood.

Keywords: Oral health; Primary teeth; Knowledge; Pediatricians; Practice; Children.

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Introduction

According to the Prevention and Control Center for Disease and Health Institute of National report, early childhood caries (ECC) is the most common infectious disease, which mainly threatens the oral health of children and infants. ECC and Severe early childhood caries (S-ECC) begin immediately after tooth eruption and cause enduring and pernicious effects on the tooth [1]. ECC is a kind of disease related to life patterns in terms of biological, behavioral, and social differences. Long-term feeding with the nursing bottle containing sugar and other liquids especially before sleeping and late-weaning are among the high risk factors of ECC. Epidemiological studies have indicated that low socioeconomic status, having preterm babies, low birth weight, and transition of microorganisms from mother to child through using a shared spoon and dummy are among factors affecting ECC [1-4].

Oral diseases like ECC, trauma, teething pain, and eruption disturbances are widely prevalent among the 4–6-year-old subgroup of population and are considered a public health problem worldwide. ECC has also been described as a social, political, behavioral, medical, psychological, economic, and dental problem, because it is epidemic in disadvantaged children, regardless of race, ethnicity, or culture. A long-term follow-up reveals that children who experience ECC are more likely to develop dental problems as they grow older and the prevalence rate ranges from 1 to 12% among preschoolers of developed countries and from 50 to 80% in high-risk groups. ECC can have a significant negative impact on the lives of children [5,6]. The first dental visit is one of the vital perspectives of children's oral health. The first dental visit provides the prevention quality and oral health of the individual in the future. It is suggested to visit the dentist as soon as the child's first tooth is erupted [7]. The integration of oral health promotion into general health care has been highly recommended by the World Health Organization [2]. Pediatricians who visit the children from their birth periodically, are in the best position to identify their early dental problems and can make their parents aware of early preventive care [7]. The results of similar previous studies indicated that pediatricians had a mediate awareness of preventing ECC [9,10]. Researchers believe that pediatricians should improve their awareness in terms of ECC and play a more highlighted role in diagnosing first signs of dental caries in children. They can teach the ways of caring for oral health and refer their suspected patients to Children's dental experts [8]. According to the study conducted by Visha Ranroop et al. (2019), 63.3% of pediatricians claimed that they had not received any parts of training regarding Children's oral health during their fellowship and they felt that more extra training was required [11]. To prevent ECC, controlling etiological factors and promoting oral health have been considered. Since pediatricians are the first group of medical staff in contact with the child and his parents, they can provide appropriate guidance regarding the habits, backgrounds, and risk factors as well as the types of preventions to the parents and improve their practice in terms of oral health of children. Pediatricians can play a significant role in preventing the possible future complications of ECC through having early identification of dental caries and referring the patients to the Children's dental experts on time [7]. Therefore the purpose of this study was to evaluate the knowledge and practice of pediatricians about Early childhood caries and its related factors.

Materials and Methods

We conducted a cross-sectional survey by means of a self-administered questionnaire. The survey was voluntary, with no identifiable information collected. The Ethics Committee of Tehran University of Medical Sciences approved the study. The target population included all pediatricians working in the public or private medical centers of Tehran city in 2020. The inclusion criteria was having at least one year experience of the pediatricians and willing to participate in the study. They answered anonymous self-administered questionnaires. The sample size was calculated (90 samples) by the Multiple Regulation power Analysis option of Pass 11 software considering ß=0.2, α=0.05, and R2=0.15 [13]. Totally 110 participants entered the study to compensate the possible loss during the study.

The questionnaire of the study

The data collection tool was a researcher-made questionnaire including demographic information, knowledge questions, and the questions regarding practice of the pediatricians. The questionnaire of the study was developed based on the previous validated ones used in the previous surveys [14-17] with minor modifications and undergone validity and reliability assessments. For measuring quantitative content validity, the questionnaire was distributed among 9 professors as the expert panels (including 7 Community oral health experts and 2 pediatric dentists). In the current study for 9 experts, the Lawshe cut-off for CVR (content validity ratio)

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equaled 0.78, meaning that all questions with at least CVR more than 0.78 would be considered as necessary and important and it would be preserved in the final questionnaire [13]. The Content Validity Index (CVI) calculated to show the "relevance", "clarity", and simplicity" of each item and the criteria for acceptance of each one was being more than 0.79" [12-14]. In addition, for qualitative content validity, the panel members assessed the items one by one and read them carefully, and wrote their comments and adjustable reviews. This section included scoring the items by observing grammar, using appropriate words, placing items appropriately where they should be. The final questionnaire was then presented to five pediatricians to measure its face validity. Afterwards, the questionnaire was distributed among 10 pediatricians twice with two weeks interval to calculate the Reliability Coefficient (Cronbach Alpha) of the questions to assess the reliability. Questions having a reliability coefficient less than 0.7, were removed from the study [12-14].

The final questionnaire comprised three sections of demographics (8 questions), knowledge (30 questions) and practice (8 questions) was provided to the participants. The knowledge questions consisted of five domains about primary teeth (8 questions), dental visits (3 questions), dental caries determinants (8 questions), eating habits (7 questions), and fluoride (4 questions). The most important barriers of pediatricians not to involve in dental caries prevention program of their patients were also asked in the questionnaire.

Statistical Analyses

To calculate the knowledge level of the pediatricians, Each question that had the correct response received a score of one and those having incorrect responses received a score of zero. Overall, the sum of the maximum allocated scores to these 30 questions was considered as the knowledge score of the pediatricians. The pediatricians`practice questions were scored as the following: Item A had three scores, item B had two scores, item C had one score and item D had zero score; the sum of scores allocated to these eight questions showed the practice score of pediatricians. All in all, the sum of the maximum allocated scores to these eight questions equaled 24. Moreover, the designed questionnaire included questions related to age, gender, working experience less than 10 years or more than 10 years, the presence or absence of dentists among their friends and relatives, receiving training related to Children's oral health during their education (in case the response is yes, whether it was in general physician period or during residency or after graduation), the interest in receiving oral health training, working place (private office, private clinic, public or university-related hospital) and the number of their daily patients.

Results

In this study, 110 pediatricians participated and 20 questionnaires were incomplete or had irrelevant information, thus, they were removed from the study and the response rate was 81.81%. The subjects were aged between 30-76 years old with an average age of 45.96±9.75 years. Of the 90 studied pediatricians, 54 (60%) were female. About 83.3% of the pediatricians stated that they did not receive any training regarding oral and dental health during their education period and 86 (95.6%) were interested in receiving this training. The detailed results related to the socio-demographic characteristics of pediatricians working in Tehran in 2020 are shown in Table 1. The mean of their knowledge score was 20.10±4.45 (out of a maximum 30) having the minimum and maximum scores of 8 and 29. Regarding factors affecting the dental caries process, studied pediatricians declared the role of dental anatomy to be 54.4% positive and others had an opposite idea. Moreover, 93.3% stated the role of bacteria, 87.8% stated the role of carbohydrates, 56.7% stated the role of salivary features and 65.6% stated the role of low fluoride to be positive and others mentioned these factors to be ineffective on dental caries.

Regarding the distribution of studied individuals based on their response to the question that whether they were confident about identifying dental caries only 10% were confident and 44.4% believed that bacteria, as the cause of dental caries, can be transmitted from mother to the child. To respond to the question that whether it is necessary to consult with parents regarding dental caries or not, 97.8% of pediatricians considered consulting necessary. Regarding the question that whether using a toothpaste containing low fluoride for children aged less than 3 years old is recommended or not, 40.0% of the participants agreed that it is recommended. In addition, 94.4% of the pediatricians believed that using the nursing bottle for a long time would lead to dental caries. As shown in Table 2, regarding the age of the first dental visit, 55.6% of the participants believed in the age of 6 months old to one-year-old, and 60 % agreed with the time interval once every 6 months. Regarding the average age at which the first primary tooth appears in a child's mouth 73.3 % considered the age six months old and for the eruption of the first permanent tooth 53.3% vot-

ed that it usually erupts at six years old (Table 2). The mean total score of studied pediatricians` practice was 15.51±3.49 (out of a maximum 24), having the minimum and maximum scores of 9 and 22. Regarding the advice to parents to use topical fluoride, 44.4% of pediatricians did it always, 46.7% of them did it most often, and 7.3% did it sometimes. Regarding the willingness to perform prevention and advising patients about oral health, 96.7% of the pediatricians were willing to do it (Table 3). The most important barriers of doing preventive actions in the field of oral health by pediatricians were the lack of knowledge on topics related to oral health (57.8%), not having enough time during the patients' visit (16.7%), noncompliance of patients (8.8%), and the inability to receive separate fees (7.8%), respectively. The results related to the relationship of various variables and studied pediatricians` knowledge using regression analysis have been indicated in Table 4. As it is observed, having passed oral health training courses was directly and significantly related to the studied pediatricians' knowledge (p=0.044, r=0.206), however, other variables had no significant relationships with pediatricians' knowledge. The results related to the relationship of various variables and studied pediatricians` practice using regression analysis have been indicated in Table 5. As it is observed, being interested in receiving oral health training courses had a direct and significant relationship with pediatricians` practice (p=0.046, r=0.206). Moreover, the relationship between pediatricians` practice and the presence of a dentist among their relatives was positive and significant (p=0.033, r=0.218). Other variables had no significant relationships with pediatricians` practice.

Table 1. Socio-demographic characteristics of pediatricians working in Tehran 2020.

Variable		Frequency	Percentage
Age	30-40	32	35.6
	41-50	27	30
	51-60	27	30
	61-70	2	2.2
	71-80	2	2.2
	Total	90	100
Gender	Female	54	60
	Male	36	40
	Total	90	100
Work experience after specialization course	Less than 10 years	39	43.3
	10 years and more	51	56.7
	Total	90	100
Workplaces	Private office	28	31.1
	Specialized clinic	10	11.1
	General or university hospital	52	57.8
	Total	90	100
Number of patients per day	Less than 10	5	5.6
	11 to 20	26	28.9
	Above 20	59	65.6
	Total	90	100
Receive oral health education	No	75	83.3
	Yes, during General Physician education	5	5.6
	Yes, during residency	5	5.6
	Yes, after graduation	5	5.6
	Total	90	100

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Variable		Frequency	Percentage
Interested in participating in the oral health training course	Yes	86	95.6
	No	4	4.4
	Total	90	100
The presence of a dentist among first-degree relatives or friends	Yes	58	64.4
	No	32	35.6
	Total	90	100

Table 2. The knowledge of Tehran Pediatricians regarding dental caries determinants with frequencies (n) and percentages (%) of correct answers.

			Correct answers	
			n	%
Dental caries determinants	Dental anatomy	Yes	49	54.4
	Bacteria	Yes	84	93.3
	Carbohydrate	Yes	79	87.8
	Saliva features	Yes	51	56.7
	Low fluoride	Yes	59	65.6
Dental caries signs	White lines or points on the teeth as the first signs of dental caries in children	Yes	43	47.8
Informing about early dental caries	Are you aware of ECC?	Yes	29	32.2
Identifying dental caries	Are you confident about identifying dental caries?	Yes	9	10
The role of genetics in early dental caries	Do you think that genetics leads to ECC?	Yes	69	76.7
Transmitting of bacteria from mother to the child	Can the bacteria, as the cause of dental caries, be transmitted from mother to child?	Yes	40	44.4
The role of oral breathing on dental caries and malocclusion	Is oral breathing a risk factor for having dental caries and temporomandibular disorders?	Yes	65	72.2
Consulting with parents regarding dental caries	Is it necessary to consult with parents regarding dental caries?	Yes	88	97.8
The knowledge of Tehran pediatricians regarding the role of feeding in dental caries				
The role of feeding			n	%
The relationship between breastfeeding and dental caries	Does breastfeeding lead to dental caries?	Yes	50	55.6
Comparing infant formula and breastfeeding regarding dental caries	Are dental caries resulting from breastfeeding less than infant formula?	Yes	68	75.6
The relationship between feeding the baby with milk while sleeping and dental caries	Do you think that breastfeeding or infant formula during the night (while sleeping) causes dental caries?	Yes	68	75.6
The role of using sugar and dental caries	Which factors affect dental caries more about consuming sugar?	The frequency of consuming	28	31.1
The relationship between using nursing bottle and dental caries	Do you think that using the nursing bottle for a long time would cause dental caries	Yes	85	94.4

			Correct answers	
			n	%
The liquid allowed to be used during the night in the nursing bottle	Which liquid is allowed to be used in the nursing bottle during the night?	Water	52	57.8
Recommended age for not using nursing bottle	What is the maximum age for using the nursing bottle?	1 year old	18	20
The knowledge of Tehran pediatricians regarding the role of fluoride in dental caries				
The role of fluoride			n	%
The relationship between fluoride and dental caries	Does fluoride have an important role in preventing dental caries?	Yes	79	87.8
The age of starting to brush the teeth	When should children start brushing their teeth with toothpaste containing fluoride?	Since the eruption of their first primary tooth	26	28.8
The role of fluoride varnish on children teeth	Using fluoride varnish for children under 5 years old causes poisoning and fluorosis	No	41	45.6
Using a toothpaste containing fluoride for children	Using a toothpaste containing low fluoride (smear layer) for children under 3 years old is recommended	Yes	36	40
The knowledge of Tehran pediatricians regarding dental visits and cases related to tooth decay				
Dental visit			n	%
Age of first dental visit	When is the best time for first dental visit	6 months-1 year	50	55.6
Appropriate interval for dental visits	How often is the appropriate time interval for a dental visit for a child?	Every 6 months	54	60
Responsible for taking care of children›s oral health	Who is responsible for visit and taking care of oral health in infants and children under one year old?	Dentist, Pediatrician	68	75.6
The knowledge of Tehran pediatricians regarding oral health and dental information				
Dental information			n	%
The age of eruption of the first primary tooth	What is the average age at which the first primary tooth appears in a child›s mouth?	six months old	66	73.3
The Age of eruption of the first permanent tooth	What is the average age at which the first permanent tooth erupts?	six years old	48	53.3
The type of first permanent tooth that erupts	Which tooth is the first permanent tooth that usually erupts?	First lower incisor or molar	27	30
The role of sealants to prevent tooth decay	Are sealants effective in preventing dental caries in the grooves of newly erupted molars?	Yes	42	46.7
The Relationship between dental problems and general health problems	Can dental problems lead to general health problems?	Yes	87	96.7
The status of oral health education during education	Was the amount of education about oral health in your residency program sufficient?	Yes	1	1.1

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			Correct answers	
			n	%
The source of information about oral and dental diseases	Where did you get information about oral and dental diseases?	Education during the residency	11	12.2
		Scientific journals	10	11.1
		Continuing education courses	16	17.8
		Other cases	47	52.2
The status of oral health care by pediatricians	Is oral health care provided by pediatricians effective for patients?	Yes	59	65.6

Table 3. The practice of pediatricians working in Tehran regarding tooth caries.

Pediatricians› practice on tooth caries			n	%
Do you give parents any advice about importance of tooth brushing and child oral health?	Yes	Always	41	45.6
		Most often	25	27.8
		Sometimes	24	26.7
	No		0	0
Do you pay attention to child's teeth during the oral examination?	Yes	Always	33	36.7
		Most often	23	25.6
		Sometimes	28	31.1
	No		6	6.7
Nutritional advices to parents to prevent tooth caries	Yes	Always	19	21.1
		Most often	29	32.2
		Sometimes	35	38.9
	No		7	7.8
Referral of children to the dentist for deal care	Yes	All children for check-up	14	15.6
		Children with dental caries	58	64.4
		Only in emergency cases	15	16.7
	No		3	3.3
Advice to parents for an initial visit to the dentist under the age of 1 year	Yes	Always	14	15.6
		Most often	14	15.6
		Sometimes	36	40
	No		26	28.9
Advice to parents to stop the pacifier and sucking habits in children under 4 years old	Yes	Always	47	52.5
		Most often	24	26.7
		Sometimes	13	14.4
	No		6	6.7
Advice to parents to use fluoride	Yes	Always	40	45.0
		Most often	42	47.7
		Sometimes	8	7.3
	No		0	0
Willingness to do preventive actions and advise to patients in the area of oral health	Yes		87	96.7
	No		3	3.3

Table 4. The relationship between pediatricians' knowledge and various variables using regression analysis.

	Not standardized coefficients		*Standardized coefficients*		*p-value*
	B	*Std/Error*	*Beta*	*t*	
Constant	*19.53*	*2.07*		*9.41*	*0.00*
Having passed oral health training courses	*1.11*	*0.549*	*0.206*	*2.040*	*0.044*

Table 5. The relationship between pediatricians` practice and various variables using regression analysis.

	Not standardized coefficients		*Standardized coefficients*		*p-value*
	B	*Std/Error*	*Beta*	*t*	
Constant	*9.023*	*2.992*		*3.016*	*0.003*
Being interested in receiving oral health trainings	*3.475*	*1.714*	*0.206*	*2.028*	*0.046*
The presence of a dentist among relatives	*1.584*	*0.732*	*0.218*	*2.164*	*0.033*

Discussion

In the present study, the knowledge and practice of pediatricians about the oral health of children in Tehran were investigated. Out of 90 participants, 60% were female and 40% were male. In the current study, the information of studied pediatricians regarding factors affecting dental caries, the first signs of dental caries in children, ECC, the role of genetics, oral breathing, bacteria, etc were different. In some cases, it was not that pleasant so 90% of the pediatricians in the current study were not confident enough in identifying dental caries. However, 97.7% of the studied pediatricians considered consulting with parents regarding dental caries as necessary. It should be mentioned that to be confident regarding consulting and providing recommendations as well as correct diagnosis, the knowledge and practice level of pediatricians had to be improved.

In the study conducted by Jafarzadeh et al. (2018), out of 53 pediatricians working in Yazd, 67.9% were male and 32.1% were female [21]. In the study conducted by Malekpour et al. (2018), 61% of the studied pediatricians were male [15]. The results of the above-mentioned two studies indicate a higher frequency of male pediatricians, which is inconsistent with the results of the present study, in which the frequency of female pediatricians was higher. Also, consistent with the results of the present study, in the study conducted by Seifi and Valizadeh (2016), it was observed that the workplace did not have a significant effect on the level of knowledge of dentists. There was no significant relationship between age work experience and level of knowledge. But in contrast, a significant relationship was found between practice and age. Also, in the study of these researchers, the level of exposure to injured patients did not affect the knowledge of dentists [16]. These results were also consistent with the results of the present study, in which only oral health training was significantly related to the level of knowledge of pediatricians and interest in receiving educations and the presence of a dentist among the relatives and friends was significantly related to the practice of the studied pediatricians, but other parameters such as age, gender, number of referrals per day, and work experience were not effective in this regard. In the study conducted by Eslamipour and Ghasemi (2013), it was observed that there was no significant relationship between the score of knowledge, attitude and practice of dentists and gender and age. These results were consistent with the results of the present study. However, in the study of the above researchers, there was a weak but significant relationship between work experience and attitude [17], which was inconsistent with the results of the present study. Also, in the study of these researchers, 80% of pediatricians were interested in taking training courses in the field of oral health, and this part of the results was again consistent with the results obtained in the present study. In Malekpour et al., study (2018), the attitude, awareness, and practice of experts were at an acceptable level. However, the responses of the experts to some of the main questions such as the dangers of long feeding through nursing bottles and its role in dental caries, the starting age of brushing the teeth, the age of

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the child for weaning and prescribing fluoride were in a weak to moderate level. Regarding the importance of these issues in preventing oral diseases of children, the need for informing is felt more than ever [15]. In contrast in the current study, 87.8% of the studied pediatricians believed that fluoride had an important role in preventing dental caries. Besides, regarding the age of starting brushing the teeth with toothpaste containing fluoride, the possibility of being poisoned due to using fluoride varnish on the teeth of children under 5 years old, the age of having a first dental visit, the results were varied and in a moderate level. As the first dental visit constructs the prevention quality and future oral health of the individual, it is recommended to have the first dental visit as soon as the child`s first tooth erupts [18].

According to the results of regression analysis, it was observed in the current study that among studied variables, having passed oral health training courses was significantly related to the pediatricians` knowledge and other variables had no significant relationships with the knowledge of pediatricians. In addition, being interested in receiving the training and the presence of a dentist among relatives and friends were significantly related to the practice of the studied pediatricians. The study of Jafarzadeh et al., (2018) was consistent with the results of the current study stating no significant relationships between the age, gender, background of pediatricians and the level of their knowledge and practice regarding oral health of their small clients [7]. Taking oral health training courses is effective in increasing the knowledge of pediatricians. Also, increasing motivation and interest in receiving training has a significant effect on the practice of pediatricians. Hence, it is recommended that the programs to be included in the educational curriculum more than before.

Limitations

In the present study, a total of 90 pediatricians were studied. It should be noted that 14 of these pediatricians did not complete the information related to their names, clinics, etc. to continue their cooperation in the future. Since this information was asked from them to cooperate with us if they wanted, it seems that these pediatricians were not very willing to cooperate in the study. Due to the limitations of our study in accessing pediatricians, it is recommended to call higher number of them through the annual retraining programs of the medical system to assess their knowledge and practice regarding oral health by completing the questionnaire meanwhile, they can receive the necessary complementary pieces of training.

Conclusion

Overall, the awareness and practice level of Tehran pediatricians regarding Children's oral health and the prevention of their dental caries were not satisfactory. Providing oral health education during related courses significantly enhanced the knowledge of pediatricians. Also, increasing the motivation and interest in receiving training, affected the practice of pediatricians in terms of oral health improvement significantly. Therefore, preparing consistent training programs of oral health for pediatricians is necessary for increasing their knowledge and interest as well as solving possible barriers to reach the important goal of maintaining oral health for children.

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Conflict of Interest

There is no conflict of interest to declare.

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