ORIGINAL ARTICLE

Knowledge, Attitude and Practice of infant Oral Health Among Pediatricians in Pakistan: A Cross-Sectional Study

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OBJECTIVE: Oral health is an essential component of a child's general health. This study aimed to assess pediatricians' knowledge, attitude and practice of infant oral health.

METHODOLOGY: A questionnaire based cross-sectional study was conducted in 2021. Questionnaires were sent through Google Forms to pediatricians all over Pakistan. The collected data were analyzed using descriptive and analytical statistics (independent sample T-test).

RESULTS: A total of 74 pediatricians out of 92 submitted their responses. These included 35 (47.3%) males and 39 (52.7%) females. Most of the participants (n = 59, 79.7%) had up to 10 years of medical practice experience, with 66.2% (n = 49) working in government hospitals. A generally positive attitude was observed with 89.2% (n = 66) of participants acknowledging their role in the prevention of dental caries. However, the majority (n = 41, 55.4%) did not examine patients for caries in their routine practice. The mean evidence-based knowledge score of the participants was 4.79 + 2.13 (maximum score 9) and the practice-based knowledge score was 1.21 + 1.21 (maximum score 3). Pediatricians who had received training in oral health were found to have a greater knowledge score, as compared to their counterparts without any training (p = 0.002).

CONCLUSION: The overall knowledge and practice of pediatricians regarding infant oral health was lacking. However, the knowledge of pediatricians with any previous training was significantly greater than their counterparts without training, thereby suggesting the need for incorporating oral health promotion training in pediatric curricula.

KEYWORDS: Infant oral health, Early childhood caries, pediatricians, oral health promotion, caries assessment

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INTRODUCTION

Oral health (OH) has been described as an integral component of general health, which significantly impacts an individual's eating, talking and social interaction.[1] Many OH related problems begin during infancy and progressively worsen as the children grow. Early detection of OH problems can prevent the diseases from worsening.[2]

One of the most significant early OH problems is early childhood caries (ECC). ECC is defined as "the presence of one or more decayed, missing (due to caries) or filled tooth surfaces in any primary tooth in a child under the age of six (REF WHO 2017)."[3] ECC is reported as a significant public health issue all over the world. Differing prevalence rates for ECC have been reported in literature, with a 0% reported occurrence in Nigeria to 98% in Cambodia.[3,4] The 2015 Global Burden of Diseases study reported primary dentition caries to be the 12th commonest disease in the world.[5] The 2017 Global Burden of Disease study reported 530 million children worldwide having primary dentition

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caries.[6] ECC is not only an issue for low income countries but for high income countries as well. The decayed component comprises of 100% of the dmft index as reported in data from Finland, Greece and Japan.[7]

The most important risk factor for ECC is the consumption of sugars primarily through bottled milk and also through other foods and drinks.[8] In addition, the unavailability of toothpastes, socioeconomic status, genetic predisposition, enamel hypoplasia, oral microflora and poor maternal and child nutritional status have also been identified as plausible risk factors for ECC.[9]

Not only do children with OH conditions have problems with eating, but they also undergo a considerable amount of pain and discomfort adversely affecting their social well-being as well.[4,10,11] Also, a considerable number of children are not cooperative to treatment at dental clinics and thus, need to be treated under general anesthesia (GA).[12] Furthermore, the economic burden associated with OH problems in children is considerable as well. Canadian reports estimate that in order to treat only one child having ECC, the cost may vary from $700 to $3000.[13] In England alone, more than 60,000 children had their teeth extracted due to caries between 2012 and 2013. The overall cost of extracting these teeth was estimated to be £27.6 million.[14] These statistics suggest that OH condition in infants is an important public health problem globally. Evidence suggests that these OH problems can be prevented through the maintenance of good oral hygiene maintenance practice supplemented by healthy eating practice. The concerning problem is that generally parents do not take their infants to a dentist for a routine checkup. Infant visits to a pediatrician or a general physician, on the other hand are usually a regular practice.[15] As a result, the first point of healthcare contact for children is a pediatrician, and not a dentist, even for OH related problems making pediatrician's role in maintaining the OH of children, crucial.[7] Therefore, evidence-based guidelines recommend that pediatricians should provide dental and dietary guidance including preventive information; early detection, early caries risk assessment, and appropriate referrals to parents and their children so as to prevent the occurrence of OH diseases to help in child's growth and development.[16]

Early intervention will provide a chance to educate parents about significant oral health issues, such as prevention of dental caries, preventing dental trauma and appropriate eating practices.[17] There is paucity of literature regarding the knowledge, attitude and practice (KAP) of pediatricians regarding infant oral health. Moreover, no study has been reported for assessing the KAP of infant oral health among pediatricians in Pakistan. This study aimed to assess the knowledge, attitudes and practice of infant oral health among a cohort of pediatricians in Pakistan, the precise knowledge and attitude of which can enhance or impede the implementation and eventual success of an oral health related preventive program.

METHODOLOGY

A cross-sectional questionnaire-based study was conducted. A validated questionnaire was used for the purpose of this study. The questionnaire was comprised of two sections. The first section was comprised of a total of 19 questions regarding the KAP of pediatricians about infant oral health. The second section included demographic (age and gender) and practice-related details of the pediatricians.

OpenEpi was used for sample size estimation. Considering a confidence level of 80% for a population of 5000 pediatricians, with an expected frequency outcome of 43.8 + 5%,[18] and a confidence limit of 5%, a sample of 157 was considered to be sufficient.

For the purpose of our study, those pediatricians who were registered with Pakistan Medical Council were included whereas, the pediatricians, who were retired, or were not practicing in Pakistan were excluded from the study. Non-probability convenience sampling was used for recruiting participants. The questionnaire was sent to pediatricians all over the country through Google forms after taking institution's ethical approval.

The responses for the KAP questions were recorded on a five-point Likert scale as 'Strongly Disagree', 'Disagree', 'Neutral', 'Agree' and 'Strongly Agree'. Data was entered and analyzed using SPSS v26.0. At the data analysis stage, these responses were dichotomized as follows 'Strongly Disagree', 'Disagree' and 'Neutral' responses were placed under the 'Disagree' category while 'Agree' and 'Strongly Agree' responses were categorized as 'Agree'.

Frequencies and percentages were described for categorial variables such as gender, experience, attitude, and practice of the pediatricians. Out of the 12 knowledge questions, nine were evidence-based knowledge (EBK), while three were practice-based knowledge (PBK) questions. Mean and standard deviation were described for quantitative variables such as age and knowledge scores of pediatricians. Independent sample T test was applied to compare the EBK scores between pediatricians who had received any kind of training in oral health promotion and those who had not received any training. A p value of less than 0.05 was considered to be statistically significant.

RESULTS

A total of 74 pediatricians participated in the study. There

were 35 (47.3%) males and 39 (52.7%) females. The majority of the participants were in the 20-30 (n = 33, 44.6%) and 31-40 years (n = 33, 44.6%) age groups. Only eight (10.8%) participants were of 41 years of age or above.

Thirty-three (44.6%) participants had less than five years of experience, while 26 (35.1%) pediatricians had between 5-10 years of experience. Nine (12.2%) participants reported having between 11 and 20 years of experience, with only five (6.8%) having more than 20 years of experience. The majority of the participants reported working in government hospitals (n = 49, 66.2%). Also, most of the participants worked in urban settings (n = 65, 87.8%).

Most of the pediatricians (n = 40, 54.1%) examined more than 25 patients a day. A total of 29 (39.7%) participants reported seeing 1-5 children with ECC every day, while 16 (21.9%) pediatricians saw 6-10 children with ECC daily. A significant majority of the pediatricians (n = 59, 79.7%) had received no training in oral health status.

The KAP responses have been illustrated in table II. The participants had a mean EBK score of 4.79 + 2.13 out of a maximum of nine. A mean PBK score of 1.21 + 1.21, out of a maximum of three. Pediatricians who had received any kind of oral health promotion training had a significantly greater mean EBK score (6.2 + 1.7), as compared to those without any training (mean EBK score = 4.43 + 2.1; p = 0.002).

Table I: Frequency of Demographics and Practice Variables

Variable		Frequency (%)
Gender	Male	35 (47.3%)
	Female	39 (52.7%)
Age Groups	20-30 Years	33 (44.6%)
	31 Years and Above	41 (55.4%)
Overall Experience	Less than 5 Years	33 (44.6%)
	5 – 10 Years	26 (35.1%)
	11 – 20 Years	9 (12.2%)
	21 Years and More	5 (6.8%)
Practice Type	Government Hospital	49 (66.2%)
	Private Hospital/Clinic	8 (10.9%)
	Both Government and Private Practice	17 (23%)
Practice Location	Urban	65 (87.8%)
	Rural	9 (12.2%)
Practice Time Per Week	Up to 50 Hours	36 (49.3%)
	51 or More Hours	37 (50.7%)
Number of Patients per Day	Up to 10	10 (13.5%)
	11 – 20	15 (20.3%)
	21 – 25	9 (12.2%)
	>25	40 (54.1%)
Number of Patients with ECC per Day	1 – 5	29 (39.7%)
	6 – 10	16 (21.9%)
	>10	13 (17.8%)
	Don't look for ECC/ don't know what ECC is	15 (20.5%)
Training Regarding Oral Health Status	Yes	15 (20.3%)
	No	59 (79.7%)

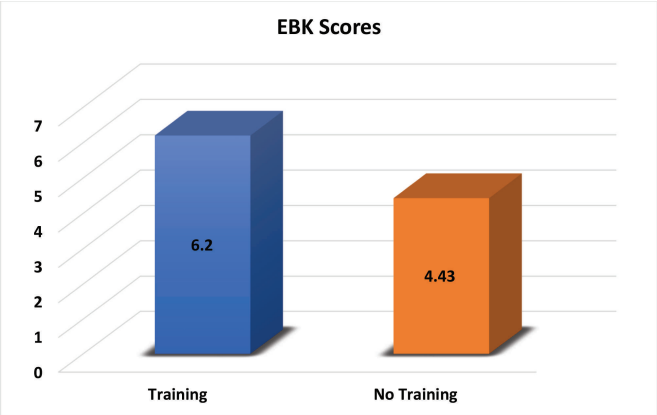
Table II: Frequency Responses of KAP Questions Regarding ECC

Item no:	Item	Disagree		Agree	
A1	Oral hygiene is important in preventing dental caries	2 (2.7%)		72 (97.3%)	
A2	Pediatricians and family physicians play an important role in prevention of dental caries and promotion of infants' oral health.	8 (10.8%)		66 (89.2%)	
A3	Pediatricians and family physicians should examine children's teeth for presence of caries.	9 (12.2%)		65 (87.8%)	
P4	I routinely examine children's teeth for presence of decay and Early childhood caries.	41 (55.4%)		33 (44.6%)	
P5	When I identify a child with a teeth decay, I always advise parents to see a dentist	14 (18.9%)		60 (81.1%)	
P6	I do diet counseling with parents or caregiver regarding cariogenic food.	25 (33.8%)		49 (66.2%)	
P7	I counsel parents or caregivers regarding teething, dental care and check-up of their children.	Always	Frequently	Sometimes	Never
		14 (18.9%)	20 (27%)	37 (50%)	3 (4.1%)
		Disagree		Agree	
K8	Primary (baby) teeth have a significant role in child's health and development.	23 (31.1%)		51 (68.9%)	
K9	White spots are the first sign of tooth decay.	36 (48.6%)		38 (51.4%)	
K10	Prolonged breastfeeding leads to dental caries.	61 (82.4%)		13 (17.6%)	
K11	Only bottle-fed babies are affected by early childhood tooth decay.	37 (50%)		37 (50%)	
K12	Bottle feeding at night leads to dental caries.	19 (26%)		54 (74%)	
K13	Bacteria that cause decay can spread from mother to child.	53 (72.6%)		20 (27.4%)	
K14	Fluoridated toothpaste should be given to children.	27 (36.5%)		47 (63.5%)	
K15	Amount of toothpaste to be used at the age of 1-3 years is smear or the size of a grain of rice.	21 (28.8%)		52 (70.3%)	
K16	Brushing should start as soon as teeth erupt.	33 (44.6%)		40 (54.1%)	
		No		Yes	
K17	I know how to perform caries risk assessment test.	52 (71.2%)		21 (28.8%)	
K18	I know how to assess whether fluoride supplements are needed for the patient and what dose might be needed.	43 (60.6%)		28 (39.4%)	
K19	I encourage all my patients to see a dentist by 1 year of child's age.	33 (44.6%)		39 (52.7%)	

Table III: Knowledge Score Comparisons for Gender, Age and Oral Health Training Status

		EBK Score	P Value	PBK Score	P Value
Gender	Male	4.66 ± 2.10	0.600	0.97 ± 1.06	0.107
	Female	4.92 ± 2.19		1.43 ± 1.30	
Age Groups	20-30 Years	4.63 ± 2.24	0.557	1.23 ± 1.22	0.896
	31 Years and Above	4.92 ± 2.07		1.20 ± 1.21	
Training Related to Oral Health	Yes	6.20 ± 1.70	0.002	1.67 ± 1.35	0.144
	No	4.43 ± 2.10		1.09 ± 1.15	

Figure I: EBK Scores of Pediatricians with and without Oral Health Promotion Training



DISCUSSION

This study was designed to determine the KAP of pediatricians regarding infant oral health. Gender distribution was well balanced in our sample. The clear majority of the participants were relatively young with 89.2% (n = 86) of the sample of 40 years of age or younger. Due to the overall young age of the participants , the experience of 79.7% (n = 59) of the sample was less than 11 years. To illustrate this association, a study on 510 European pediatricians with a mean age of 52.82 years, the mean experience of the participants was 23.96 years.[1] Furthermore, the majority of the participants were working in a government-based hospital (n = 49, 66.2%). Some of these also had private practices as well. In contrast, only 23% (n = 15) of a cohort of Indian pediatricians worked in government hospitals.[17] However, these figures could possibly be due to a low sample size selected in the Indian study (n = 65) In a European cohort of 510 pediatricians, 38.2% worked in government setups.[1] The majority of the participants in our study also reported to be practicing medicine in urban areas (n = 65, 87.8%).

The overall attitude of the pediatricians was found to be positive. Seventy-two (97.3%) of the participants considered oral hygiene to be significant in the prevention of dental caries. They also agreed that they have a significant role to play in preventing dental caries and that they should examine the teeth of children as well. Hadjipanayis et al, in a study of pediatricians from 26 European countries reported that 97% (n = 495) of the participants agreed that they have a significant role to play in caries prevention.[1]

However, these opinions were found to be in contradiction with their practice. Only 44.6% (n = 33) of the pediatricians in our study reported examining children's teeth for the presence of caries on a routine basis. Similarly, in a study assessing the knowledge and practices of Australian pediatricians, Koirala et al. reported that 48.5% (n = 80) of the participants only looked for dental caries in half of the patients.[19] Interestingly, 89.2% (n = 58) of a cohort of Indian pediatricians reported examining the primary teeth of their patients.[19] Moreover, 78% (n = 400) of European pediatricians reported examining patients for oral health conditions as well.

Most of the participants in our study (n = 49. 66.2%) did however counsel the parents regarding cariogenic food. Similarly, Koirala et al reported that 60.5% (n = 95) of a cohort of Australian pediatricians counseled the parents regarding the ill-effects of cariogenic food.[19] Gupta et al. also reported counselling 73.7% (n = 65) of the their patients regarding healthy diet.[17]

With regards to the mean knowledge score related to ECC, pediatricians had a generally low knowledge of ECC from a theoretical and practice-based perspective. Most of the pediatricians (n = 52, 71.2%) did not know how to conduct a caries risk assessment. In contrast, 52% of Australian pediatricians in a study by Koirala et al. reported having the knowledge to conduct an oral examination.[19] Furthermore, a significant proportion (n = 33, 44.6%) of the participants in our study also did not encourage parents for a child dental visit by the age of one year.

In our study, no difference in EBK and PBK was found between the two genders and different age groups. Similarly, Renad et al found no difference in the pediatrician's knowledge of oral health between male and female participants. A major concern in our study was the low proportion of pediatricians trained in any kind of oral health education and examination (n = 15, 20.3%). Inadequate training in oral health issues has been reported as a significant barrier for pediatricians to actively participate in oral health promotion.[20] Interestingly, Slade et el reported that is physicians are trained in oral health promotion, they are highly likely to actively participate in oral health education and prevention of dental diseases.[21]

The European Academy of Pediatric Dentistry recommends that brushing with a fluoridated toothpaste should commence soon after six months of age.[22] In our study, 36.5% (n = 27) of the participants were not aware that fluoridated toothpaste may be given to children. Similarly, 36% of European pediatricians were also not aware of this as well.[1]

As per the American Academy of Pediatric Dentists guidelines, the first examination of a child should take place soon after the first tooth erupts.[11] A large proportion of pediatricians (n = 33, 44.6%) did not encourage the parents for an early dental visit. Interestingly, 43% of European pediatricians reported recommending parents to visit a dentist after a child is three years of age.[17]

ECC has been reported to be aggressive, severely impacting the oral health of children. In our study, 39.7% (n = 29) of the pediatricians reported seeing more than five children with ECC every day. In comparison, 74% of the pediatricians reported diagnosing one patient of ECC per month in a European cohort.[1] Similarly, 47% of Iranian pediatricians reported diagnosing at least one patient every month.[23] The higher proportion of the reported ECC patients may be misleading, since a significant majority (n = 59, 79.7%) reported receiving no training in oral health examination. Thus, their diagnosis of ECC may not truly reflect the exact figures. Furthermore, the prevalence of ECC in a developing country such as Pakistan are much higher than those reported for developed countries in Europe. Some variation in results may also be explained by this health inequality. A scoping review by Swift et al. identified lack of training; time limitations; and lack of referral systems as significant barriers in pediatricians' lacking in the knowledge and practice of managing oral diseases in children.[24] Alshunaiber et al. reported that 76.7% of Saudi pediatricians reported a need for more training in oral health promotion and caries assessment.[25] Since 2007, American pediatricians must be competent in implementing oral health screening and be aware of oral health prevention measures in order to pass American Pediatric Board Certification examinations.[18] The findings of our study suggest that the knowledge of pediatricians who have undergone any kind of oral health promotion training is significantly higher than their counterparts without any training ($p = 0.002$).

A number of factors have been identified as significant barriers for pediatricians not taking the recommended care of infants' oral health. First and foremost is the lack of training in oral health promotion and assessment which was identified as the most significant factor. Moreover, lack of time due to clinical commitments was another significant issue. Efforts need to be made to design tailored continuing education programs for qualified pediatricians. An oral health promotion module should also be designed and incorporated within the pediatricians' specialty training program.

One of limitation of the current study could be selection bias due to its sampling design involving a convenience strategy. Also, the sample size was relatively low.

CONCLUSION

The results of this study highlight the inadequate knowledge of infant oral health among pediatricians in Pakistan. The results may be used to inform future guidelines regarding incorporating oral health education among pediatric training. Although the pediatricians were aware of their role in the prevention of ECC, their training in oral health promotion and caries assessment was evidently lacking. The current undergraduate and postgraduate Pediatrics curricula in Pakistan should incorporate oral health promotion and caries assessment education. Moreover, Continuing Education courses in these areas should also be arranged for pediatricians.

CONFLICT OF INTEREST

No conflict of interest to declare

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