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ORIGINAL ARTICLE

PEDIATRICIANS AT THE FOREFRONT: ROLE OF PEDIATRICIAN IN DETECTION AND PREVENTION OF ORAL DISEASES

Hammad Hassan[1], RabiaAsad[2], Muhammad Tauseef Rauf[3], Amna Sohail[4], AsmaShakoor[5], ZenabYaasir[6]

[1]Assistant Professor, Science of Dental Materials, Azra Naheed Dental College, Superior University, Lahore
[2]Professor, Community & Preventive Dentistry Department, M. Islam Medical and Dental College, Lahore
[3]Senior Medical officer, Neonatology Department, University of Child Health Sciences and Children's Hospital Lahore.
[4]BDS Graduate, Institute of Dentistry, CMH Lahore Medical College, NUMS
[5]Associate Professor, Community and Preventive Dentistry Department, CMH, Lahore Medical College, NUMS
[6]Professor, Science of Dental Materials, M. Islam Medical and Dental College, Lahore

Correspondence:
Dr. Hammad Hassan
Email: hammadhassanh@gmail.com

Abstract

Background: Pediatricians have prominent role in the prevention and diagnosis of oral diseases, as in early childhood, children typically visit pediatricians more frequently than dentists.

Objective: To assess pediatricians' knowledge, attitudes, and practices regarding the diagnosis and prevention of oral diseases in children.

Material and Methods: This cross-sectional study involved pediatricians from nine private and public Hospitals in Lahore, Punjab from Jun 2021 to Dec 2023. The data was collected using an online questionnaire distributed via Whatsapp and Facebook groups, targeting practicing pediatricians. The questionnaire assessed demographics, knowledge, attitudes, and practices related to pediatric oral health. Knowledge was scored from 0 to 9, with higher scores indicating better knowledge. Data analysis was performed using SPSS version 25.

Results: Out of 280 pediatricians contacted, 138 responded (49.3% response rate). Female pediatricians and those in public practice demonstrated significantly higher knowledge scores compared to their counterparts ($p < 0.05$). Pediatricians with over 15 years of practice had the highest knowledge scores ($p = 0.002$). A majority (98.6%) recognized their role in preventing dental caries, but fewer felt confident performing preventive measures due to limited training. Familiarity with preventive treatments like fluoride varnish was higher in public Hospitals. There was a strong consensus (89.8%) on the need for specialized training courses.

Conclusion: Pediatricians in Lahore show a high level of willingness to engage in oral health care, but there is a significant gap in knowledge and practical implementation, particularly in private practice. Enhanced training and interdisciplinary collaboration are essential to improve pediatric oral health outcomes.

Keywords: Healthcare Collaboration, Knowledge, Attitude, Practice (KAP), Oral Health Practices,

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Introduction:

The basis of healthy teeth is laid during the initial years of life. Improper nutrition, habits and inadequate brushing can lead to poor oral and systemic health in children[1].Pediatricians have a key role in prevention and diagnosis of oral diseases as most of the younger population visit pediatricians more than dentist.[2]

Previous studies have shown that 9 out of every 10 children visit the pediatrician during the first year of life.[3,4]However, only around 1 out of 10 children show up to the dentist from infancy to first year of life.[5]It is estimated that more than 4 out of 10 children experience tooth decay before preschool, while 2 in 10 children suffer from extreme tooth decay also known as rampant caries worldwide.[6]The prevalence of nursing bottle caries is as high as 70 indeveloping countries.[7]Similarly, gingivitis is also a common observation in children with a prevalence of more than 70% in developed countries.[8]These statistics show that involvement of pediatrician is key when it comes to management of common oral diseases at an early stage.[2,7]

The data regarding dental caries and its prevalence is scarce and limited in Pakistan.[9]Studies have shown that the prevalence of caries in Pakistani children is around 60 to 90%, with much higher prevalence in school going children and children living in rural areas.[10,11]A preventive role played by pediatrician can effectively reduce patient load and stress on dentists in

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Pakistan.[4]

Willingness of pediatrician is of paramount importance regarding oral health promotion and disease prevention.[12]Previous studies have shown that the majority of pediatricians agree to play a bigger role in oral health betterment and preventive education, despite limited training in the area.[4,13]However, a low percentage of pediatricians believe that preventive services can be performed by pediatricians during routine checkup.[12]American Academy of Pediatrics issued a statement, suggesting pediatricians to develop a knowledge base to perform oral health risk assessment on all patients starting from 6 months of age.[2]

North Carolina Society of Pediatrics and North Carolina Academy of Family Physicians offers an AMA-approved continuing medical education course (CME) that allows pediatricians to perform preventive dental procedures in their offices.[14,15]

Appropriate health related facilities in Pakistan are scattered, limited and only restricted to cities and developed areas.[16]For a population of 110 million, only 84,000 doctors are available and ratio of pediatrics among them is even low. The child to pediatrician ratio and limited facilities affects the attitude of pediatrician regarding common oral diseases.[17]

The aim of this study is to find out the knowledge, attitude, and practice of pediatricians regarding risk factors, diagnosis and prevention of common oral diseases as well as the extent of their willingness to encompass preventive dental education and simple preventive procedures in their practices.

Material and Method:

Study Design:

This questionnaire-based descriptive cross-sectional study was conducted with the approval of the Institutional Review Board (IRB) of the Institute of Dentistry, CMH Lahore Medical College (Case 623/ERC/CMH/LMC), and with the permission of the respective administrations of the participating institutes.

Study Setting and Duration:

The study was carried out in nine different private and public hospitals in Lahore, Punjab, from June 6, 2021, to December 1, 2023.

Sample Size and Method:

Participants were selected using a purposive sampling technique, which may introduce selection bias as the sample may not fully represent the broader target population. The total sample size of 138 pediatricians was calculated through Open-Epi, using a 90% power of the study and a 5% level of significance (1.96). The calculation took into account a margin of error of 0.05 and an expected prevalence ratio of 0.9.[18]

Inclusion Criteria:

Pediatricians practicing in hospital and private clinical settings in Lahore, Punjab who agreed to participate in the study.

Exclusion Criteria:

Non-pediatric medical doctors and pediatricians not actively involved in clinical practice.

Questionnaire Development:

The questionnaire was developed by incorporating extant literature and expert opinions in the field of pediatric healthcare. It encompassed sections on pediatric oral health practices, attitudes, knowledge, and demographics. The questionnaire consisted of 30 items, divided into several sections to comprehensively assess the knowledge, attitudes, and practices of pediatricians regarding oral health. Among these, there were 9 knowledge-based questions. Each correct answer was awarded one mark, while incorrect answers or expressions of unawareness received zero marks. The knowledge assessment was categorized as follows: a score of 3 or below indicated poor knowledge, a score between 4 and 6 indicated moderate knowledge, and a score of 7 and above indicated good knowledge concerning the detection and prevention of oral diseases. This scoring system allowed for a clear evaluation of the pediatricians' understanding of oral health, facilitating the identification of areas needing improvement or further education. The content validity of the questionnaire was verified through a review process conducted by subject matter experts, and it was later pilot tested on 40 participants to refine the questions for clarity and relevance. These participants were excluded from the final analysis. The reliability analysis was performed using Cronbach's alpha and the score was 0.672, falling within the acceptable range.

Data Collection:

The survey was conducted by distributing online questionnaires to registered practicing pediatricians working in hospitals and clinical practices in Lahore through Whatsapp and Facebook groups. A focal person from each hospital was contacted and requested to share the questionnaire link within their respective Whatsapp or Facebook groups. These platforms were used for survey distribution due to their widespread use and the ability to rapidly reach a large sample at low cost. Moreover, to enhance participation, reminders were sent periodically, and the importance of the study in improving pediatric oral health was emphasized. The questionnaire was designed to capture detailed demographic information, knowledge levels, attitudes, and practices regarding the detection and prevention of oral diseases among pediatricians.

Statistical Analysis:

Data collected through the questionnaires was entered, stored, and analyzed using the IBM Statistical

Package for Social Sciences (SPSS version 25, IBM Corporation, USA, New York, 2011). The Shapiro-Wilk test was used for normality assessment. Mean and standard deviation were calculated for quantitative variables i.e., knowledge scores. The independent sample T-test was used to compare means, and the Chi-Square Test was used to compare the frequencies of the categorical variables. A p-value less than or equal to 0.05 was considered significant.

Results:

A total of 84 individuals out of 192 screened, presenting with dyspepsia were enrolled in the study. The demographic breakdown revealed that out of the 84 participants, 37 individuals (44.0%) were male, while 47 individuals (56.0%) were female. The average age of the participants in the study was 34.5 years, with a standard deviation of 12.88 years. This means that while the typical age was 34.5, ages within the group varied, with a typical spread of about12.88 years around that average.

In terms of age distribution, 78 individuals (92.9%), fell within the age group of 50 years or younger, whereas a smaller proportion, comprising 6 individuals (7.1%), belonged to the age group older than 50 years. When considering the distribution based on proton pump inhibitor (PPI) use, it was found that 35 individuals (41.7%) reported prior use of PPI, while the remaining 49 individuals (58.3%) had not utilized PPI.

the distribution based on residence, it was observed that 46 individuals (constituting 54.8%) resided in cantonment area, whereas 38 individuals (45.2%) were identified as residing outside of the cantonment area. The mean household size was 6.03 ± 1.81 member.

Sanitation levels were categorized as excellent (16.7%), good (58.3%), and fair (25.0%). In terms of

Moreover, among the patients included in the study, it was identified that 11 individuals (13.1%) were smokers, 3 individuals (3.6%) had diabetes, 6 individuals (7.1%) were diagnosed with hypertension, and 2 individuals (2.4%) were reported to be on NSAIDs. Among the dyspeptic patients, the presence of H. pylori infection was detected in 48 individuals (57.1%). Furthermore, a detailed analysis was conducted to stratify the H. pylori status in relation to various demographic and clinical variables, revealing no significant differences observed (p>0.05) between the groups

Table 1: Demographic Characteristics and Knowledge Scores of Pediatricians

Variables		n(%)	Knowledge Scores	P-value
Gender	Male	58(42)	4.55±1.68	0.007
	Female	80(58)	5.30±1.47	
Type of Practice	Private	28(20.3)	4.36±1.19	0.020
	Public	110(79.7)	5.15±1.66	
Years of Practice	Less than 2 years	8(5.8)	3.50±1.77	0.002
	2 to 5 years	35(25.4)	4.46±1.73	
	6 to 15 years	75(54.3)	5.25±1.48	
	More than 15 years	20(14.5)	5.50±1.23	
Designation	Postgraduate Trainee	16(11.6)	5.25±1.34	0.664
	Senior Registrar/Medical Officer	62(44.9)	4.90±1.90	
	Assistant Professor and Above	22(15.9)	5.27±1.16	
	Consultant	38(27.5)	4.84±1.40	
Additional diploma in pediatric dentistry	Yes	6(4.3)	4.67±2.25	0.621
	No	132(95.7)	5.00±1.58	
Co-training with dental surgeons	Yes	8(5.8)	4.25±1.58	0.183
	No	130(94.2)	5.03±1.60	

P-values were calculated using independent sample t test and one way ANOVA

The majority of pediatricians (98.6%) agreed that they can play a role in preventing dental caries and other oral diseases. A significant portion (89.9%) believed that they could perform oral preventive measures in their daily practice, with no significant difference between private and public practitioners. Familiarity with preventive dental treatments like fluoride varnish was higher in public hospitals (61.8%) compared to private hospitals (50%) (p = 0.014). Pediatricians in private hospitals (78.6%) were more likely to encourage regular dental check-ups than those in public hospitals (52.7%) (p = 0.013) (Table 2).

Table 2: Comparison of Attitudes and Practices Regarding Oral Health between Private and Public Hospital Pediatricians					
Statements	**n(%)**	**Private n(%)**	**Public n(%)**	**X2**	**P**
Pediatricians can play a role in preventing dental caries and other common oral diseases					
Yes	136(98.6)	28(100)	108(98.2)	0.51	0.634
No	2(1.4)	0(0)	2(1.8)		
Pediatricians can perform oral preventive measures in his/her daily practice					
Yes	124(89.9)	26(92.9)	98(89.1)	0.34	0.735
No	14(10.1)	2(7.1)	12(10.9)		
There should be special courses or diplomas to train pediatric graduates regarding oral health, diseases & preventive services					
Yes	124(89.8)	28(100)	96(87.3)	3.96	0.073
No	14(10.1)	0(0)	14(12.7)		
Familiarity with preventive dental treatments					
Fluoride varnish	82(59.4)	14(50)	68(61.8)	10.56	0.014
Dental sealants	6(4.3)	0(0)	6(5.4)		
Both	2(1.4)	2(7.1)	0(0)		
No Familiarity	48(34.7)	12(42.9)	36(32.7)		
Comfortable with performing preventive procedures in daily practice after training					
Yes	78(56.5)	20(71.4)	58(52.7)	3.17	0.090
No	60(43.4)	8(28.6)	52(47.2)		
Can diagnose dental caries					
Yes	128(92.8)	28(100)	100(90,9)	2.74	0.098
No	10(7.2)	0(0)	10(9.1)		
Do you examine teeth for dental caries					
Yes	96(69.6)	24(85.7)	72(65.4)	4.44	0.108
No	42(30.4)	4(14.3)	38(34.6)		
How often you see dental caries in your practice					
Frequently	54(39.2)	16(57.1)	38(34.6)	8.27	0.016
Rarely	46(33.3)	10(35.7)	36(32.7)		
Never	38(27.5)	2(7.1)	36(32.7)		
Advise nursing mothers about regular cleaning of their child's oral cavity after feeding					
Yes	86(62.3)	20(71.4)	66(60)	1.54	0.462
No	52(37.7)	10(35.7)	42(38.2)		
Do you encourage your patients for regular dental checkup					
Yes	80(58.0)	22(78.6)	58(52.7)	6.11	0.013
No	58(42.0)	6(21.4)	52(47.3)		

P-values were compared using chi-square test

Postgraduate trainees, senior registrars, medical officers, assistant professors, and consultants showed no significant differences in attitudes toward oral health preventive measures. Pediatricians seeing dental caries in their practice varied significantly, with consultants reporting it more frequently (72.7%) compared to other designations (p = 0.004). Advising nursing mothers about regular oral cleaning varied by designation, but the differences were not statistically significant (Table 3).

Table 3:Designation-wise comparison of attitude and practices of pediatricians regarding oral health							
Statements	**n(%)**	**Postgraduate Trainee n(%)**	**Senior Registrar/Medical Officer n(%)**	**Assistant Professor and Above n(%)**	**Consultants n(%)**	**X2**	**P**
Pediatricians can play a role in preventing dental caries and other common oral diseases							
Yes	136(98.6)	16 (100.0)	62 (100.0)	20 (90.9)	38 (100.0)	10.70	0.013
No	2(1.4)	0 (0)	0 (0)	2 (9.1)	0 (0)		
Pediatricians can perform oral preventive measures in his/her daily practice							
Yes	124(89.9)	16 (100.0)	56 (90.3)	22 (100.0)	30 (78.9)	9.26	0.026
No	14(10.1)	0 (0)	6 (9.7)	0 (0)	8 (21.1)		
There should be special courses or diplomas to train pediatric graduates regarding oral health, diseases & preventive services							
Yes	124(89.8)	14 (87.5)	56 (90.3)	20 (90.9)	34 (89.5)	0.14	0.986
No	14(10.1)	2 (12.5)	6 (9.7)	2 (9.1)	4 (10.5)		
Familiarity with preventive dental treatments							
Fluoride varnish	82(59.4)	10 (62.5)	40 (64.5)	10 (45.5)	22 (57.9)	15.32	0.082
Dental sealants	6(4.3)	0 (0)	4 (6.5)	0 (0)	2 (5.3)		
Both	2(1.4)	0 (0)	0 (0)	2 (9.1)	0 (0)		
No Familiarity	48(34.7)	6 (37.5)	18 (29.0)	10 (45.5)	14 (36.8)		
Comfortable with performing preventive procedures in your daily practice after proper training							
Yes	78(56.5)	6 (37.5)	36 (58.1)	16 (72.7)	20 (52.6)	5.00	0.172
No	60(43.4)	10 (62.5)	26 (41.9)	6 (27.3)	18 (47.4)		
Can you diagnose dental caries							

Yes	128(92.8)	16 (100.0)	56 (90.3)	22 (100.0)	34 (89.5)	4.12	0.249
No	10(7.2)	0 (0)	6 (9.7)	0 (0)	4 (10.5)		
Do you examine teeth for dental caries							
Yes	96(69.6)	16 (100.0)	38 (61.3)	18 (81.8)	24 (63.2)	13.12	0.041
No	42(30.4)	0 (0)	24 (38.7)	4 (18.2)	14 (36.8)		
How often you see dental caries in your practice							
Frequently	54(39.2)	2 (12.5)	22 (35.5)	16 (72.7)	14 (36.8)	19.22	0.004
Rarely	46(33.3)	6 (37.5)	22 (35.5)	6 (27.3)	12 (31.6)		
Never	38(27.5)	8 (50.0)	18 (29.0)	0 (0)	12 (31.6)		
Do you advise nursing mothers about regular cleaning of their child's oral cavity after feeding							
Yes	86(62.3)	14 (87.5)	34 (54.8)	10 (45.5)	28 (73.7)	12.53	0.051
No	52(37.7)	2 (12.5)	28 (45.2)	12 (54.5)	10 (26.3)		
Do you encourage your patients for regular dental checkup							
Yes	80(58.0)	12 (75.0)	36 (58.1)	12 (54.5)	20 (52.6)	2.45	0.483
No	58(42.0)	4 (25.0)	26 (41.9)	10 (45.5)	18 (47.4)		

P-values were using chi-square test

Discussion:

This study highlights the critical role pediatricians can play in the early detection and prevention of oral diseases. The findings underscore that while there is a high level of willingness among pediatricians to engage in oral health care, there remains a significant gap in knowledge and practice, particularly in the private settings.

Pediatricians can detect early signs of oral diseases such as dental caries and dent facial abnormalities, allowing for timely interventions, and often the first point of contact, making them ideally positioned to identify and address oral health issues early.[19] In the present study, vast majority (98.6%) of pediatricians acknowledge their role in preventing dental caries and other common oral diseases. However, only a smaller proportion feels confident performing preventive measures due to limited training in this area.

Previous studies indicate that while many pediatricians understand the importance of oral health, there is often a gap in the implementation of this knowledge in practice especially when it comes to performing oral health assessments, providing fluoride supplements and pits and fissure sealants.[1,2]The findings of the current study are consistent with the previous data, where pediatricians are willing to play a role in oral health, but they lack the necessary training and confidence to do so effectively.[2,4]

In this study, female pediatricians demonstrated better knowledge regarding the detection and prevention of oral diseases, which could be attributed to differences in educational background, professional training, or intrinsic motivation towards pediatric dentistry. Additionally, those practicing in public hospitals demonstrated higher knowledge levels. This difference could be attributed to varying levels of exposure and training opportunities available in public versus private institutions.[20]Public sector in Pakistan experience a higher patient flow rate from all demographic backgrounds, especially lower socioeconomic background, making pediatricians more expose and aware of the multitude of oral issues reported to them.[21]Moreover, in this study, years of practice also played a significant role in knowledge levels, with more experienced pediatricians demonstrating greater knowledge. This trend is expected as more experienced practitioners are likely to have encountered a wider range of clinical scenarios and have had more opportunities for professional development.

Pediatricians are encouraged to counsel parents on dietary and oral hygiene practices that prevent dental caries.[2]They can also refer patients for professional dental care when necessary.[4]In the current study, around six out of every ten pediatrician encouraged patients for regular dental checkup and advised nursing mothers aboutregular cleaning of the oral cavity, which is very crucial to avoid oral health issues like caries, especially rampant caries in children.[22]

A significant barrier to pediatricians' involvement in oral health care is the lack of training.[23] Most pediatricians receive minimal education on oral health during their medical training, limiting their ability to perform effective oral health assessments.[2]These findings were consistent with the previous data as a notable proportion of pediatricians in this study reported unfamiliarity with preventive dental treatments such as fluoride varnish and dental sealants.[1,2,13]This lack of familiarity is concerning given the effectiveness of these treatments in preventing dental caries. Pediatricians can play a critical role in prescribing systemic fluoride supplements and offering preventive guidance on oral health and diet, which are essential for preventing dental caries in young children.[13]

American Academy of Pediatrics recommends pediatricians to develop a knowledge base for performing oral health risk assessments starting at six months of age through such special courses.[23]Moreover, such training programs in North Carolina and Tennessee demonstrated their effectiveness and could equip pediatricians with the necessary skills to perform preventive dental procedures effectively.[24]This study highlights a critical

need for specialized training and continuing education programs for pediatricians regarding oral health and reported a vast consensus (89.8%) among pediatricians about the need for special courses to enhance their competence in managing oral health issues.

The present study also sheds light on the broader systemic issues within the Pakistani healthcare system that affect pediatricians' ability to address oral health effectively.[16,20]With a limited number of pediatricians serving a vast population and ever lesser number of dentist available, especially in rural areas, the healthcare system is predominantly treatment-focused rather than prevention-oriented.[17,21]Enhancing preventive care capabilities among pediatricians could alleviate some of the pressures on the dental care system and improve overall health outcomes for children.[23]Integrating oral health training into the pediatric curriculum and providing continuous professional development could enhance the role of pediatricians in oral health care. Additionally, policy initiatives aimed at promoting interdisciplinary collaboration between pediatricians and dental professionals could further improve the management of oral diseases in children.[4]

While this study provides valuable insights, it has certain limitations like cross-sectional nature and use of a non-probability purposive sampling technique may limit the generalizability of the findings. Moreover, the survey was distributed via Whatsapp and Facebook groups, there is a potential for selection bias, as only pediatricians who are more socially connected may have been reached and chosen to participate. This could limit the representativeness of the sample and affect the generalizability of the findings. Future research should consider employing longitudinal designs and larger, more representative samples to validate these findings.

Conclusion:

The study underscores the pivotal role pediatricians can play in the early detection and prevention of oral diseases in children. Despite a high level of willingness to engage in oral health care, there remains a notable gap in knowledge and practice, particularly among those in private practice. Female pediatricians, those working in public hospitals, and more experienced practitioners demonstrated higher levels of knowledge regarding pediatric oral health. Most pediatricians agreed on the necessity of specialized training to enhance their competence in managing oral health issues. The findings provide valuable insights, although the study is limited by a small sample size and purposive sampling technique. Implementing structured educational programs and fostering collaborative efforts between pediatric and dental professionals are essential steps toward improving oral health outcomes in children.

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