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Pediatrician`s KAP Profile regarding Dento-Facial Malocclusion among Southern Punjab, Pakistani Residents

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Abstract

Introduction: Children who have poor dental habits and crooked teeth may experience problems with their oral and extra oral features and self-esteem. Pediatricians are in a position to detect these problems early and help manage them because they are the primary care doctors for children. The aim of this study was to evaluate the KAP Profile of pediatricians regarding dento-facial malocclusion among southern Punjab, Pakistani residents.

Methodology: A cross-sectional survey was conducted between July 2025 to January 2026 for 210 Pediatricians, Family Physicians and Post-graduate Trainees. Participants completed a pre-validated, structured 30-question electronic survey designed to evaluate their knowledge and practices related to these issues. The response were analyzed using SPSS software to identify trends and patterns.

Results: The majority of respondants were aware of the etiology of pediatric oral condition, especially thumb sucking (95.2%) and extended pacifier use (85.7%). The majority of respondents (93.3%) reported referring children with malocclusion to dental professionals, and a sizable majority (95.2%) thought paediatricians had a significant role in preventing dental issues. Only 33.3% of participants, however, had attended workshops specifically addressing these dental problems. The results also showed that pediatricians' handling of these disorders was strongly correlated with their years of clinical experience and workplace environment.

Conclusions: The majority of participants knew that pediatricians play a crucial role in preventing orthodontic anomalies and parafunctional oral habits, but they lacked the necessary training and experience to conduct a thorough and methodical examination for malocclusion and parafunctional oral habits.

Keywords: Pediatricians, oral habits, malocclusion, children, patient care, referrals

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Introduction

Dento-facial deformities, malocclusion and aesthetics have come up in the recent years as major concerns among the younger population and lead to need for orthodontic management. Aberrant oral habits such as thumb sucking, tongue thrusting, nail biting, lip biting, bottle feeding, and mouth breathing have been linked with the dento-facial concerns (aesthetics'/function) thereby affecting the quality of life.[1] According to the American Academy of Pediatrics (AAP), 89% of infants visit pediatrician each year, while only 1.5% by the orthodontist.[2] Thus Pediatricians are the first healthcare providers to assess children, they are more likely than orthodontists to detect these habits early and

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play a key role in coordinating comprehensive interdisciplinary care1. Recent research indicates that nail biting and finger sucking, can raise an individual's exposure to oral germs, including Escherichia coli and Enterobacteriaceae.[3] Pediatricians thus should be well-trained to manage / triage dento-facial concerns.[4]

During routine child health visits, pediatricians can literate parents about preventive practices and better oral hygiene care. They can guide parents / children regarding harmful effects of various para-functional habits. Early detection and timely dental referrals can improve treatment outcomes and minimize the need for extensive orthodontic management. Therefore, physicians should include dental assessment in routine examinations to identify signs of malocclusion, such as crowding, spacing problems, or jaw discrepancies, and ensure timely intervention. To improve pediatrics general oral health and well-being, to establish preventative strategies, and guarantee continuity of care, medical and dental experts must work together.[5]

Routine oral health practices among pediatricians, however, remain limited due to inadequate training, time constraints, and insufficient referral pathways. Integrating oral health education into medical curricula and providing adequate resources may enhance children's access to dental care.[6]

Oral health is a vital component of overall health, particularly during childhood, as it affects long-term quality of life. The World Health Organization recognizes oral health as an essential part of comprehensive healthcare and emphasizes the role of primary care providers, especially physicians, in promoting it. Dental caries is one of the most common chronic diseases in children, affecting approximately 25% of preschool children and at least one in six children at age 6–11 years. Untreated caries can lead to pain, difficulty eating, impaired growth, reduced self-esteem, and communication problems. However, studies have shown that pediatricians often have limited knowledge regarding key aspects of oral health, including early signs of dental caries, the recommended age for the first dental visit, mother-to-child bacterial transmission, and appropriate fluoride use.[7]

A study was conducted in Qatar whereby a pre-validated questionnaire was distributed electronically to 417 practicing pediatricians/family in Qatar. Physicians demonstrated moderate levels of cognition and professionalism but poor impact (44%) on their practices.[8] In another study it was found that children are reporting fairly late to patricians than the time frame recommended by WHO, demonstrating low health awareness of even parents and guardians.[9]

Primary prevention is essential for improving oral health. Through early oral health assessments and anticipatory guidance, pediatricians can encourage timely dental visits alongside routine medical care.[9] Although studies have shown that many pediatricians have positive attitudes and adequate knowledge regarding oral healthcare, their practices, particularly in educating parents about oral health, require further improvement. A study conducted at Hyderabad district in India concluded that a high proportion of the pediatricians have a good understanding, but their practices need to be improved in educating the parents about oral health.[10]

It is impossible to separate oral health from general health. Chronic pain caused by dental caries can significantly affect the well-being of children and their families by disrupting sleep, impairing eating, and hindering growth, development, and learning. Therefore, parents' awareness and knowledge of their children's oral health are essential for

preventing these adverse effects. There is a need to educate society about deciduous teeth, their importance, and the necessity of visiting the dentist regularly.[11]

This study aims to raise awareness of the role pediatricians play in preventing orthodontic problems in children by examining the knowledge, attitudes, and practices of pediatricians working in South Punjab regarding the prevention of malocclusion and parafunctional oral habits.

Methodology

A cross-sectional survey was conducted among healthcare professionals working in government and other healthcare facilities, including Pediatricians, Family Physicians and relevant Post-graduate Trainees. The study was carried out between July 2025 and January 2026, and a total of 210 pediatricians participated. Sample size was determined through Raosoft® sample size Calculator based upon total number of participant categories in area. Data were collected using a structured electronic pre-questionnaire consisting of 30 items that assessed participants' demographic characteristics, knowledge of children's oral health, and their attitudes and practices related to pediatric oral care. Sample was selected through convenient sampling technique. Ethical approval for the study was obtained from the Multan Ethical Board of CIMS Dental College (Ref: 2133/Trg/20MDC/CDC).

The questionnaire used in this study has five parts. It asks about the participants basic information, risk factors for teeth and what pediatricians think about preventing crooked teeth and bad habits. The first part asks for information like age, gender, job title and how long they have been working as a doctor. It also asks about how many patients they see daily and where they got their specialist training. The second part has questions about what pediatricians know about things that can cause orthodontic problems. The third and fourth parts ask about what pediatricians do when they check kids teeth and how they prevent teeth problems. The fifth part asks if pediatricians got training, on habits and preventing crooked teeth and where they got that information. The questionnaire was converted into electronic format (google form) and distributed (through whatsapp link). When the calculated sample size was achieved, further data was not included.

Statistical Analysis:
The statistical analyses were done using SPSS version 26. Descriptive statistics were used to summarize categorical variables, which were presented as frequencies (n) and percentages (%) and The Chi-Square test was used to find out if there was a link between doctors demographic details their work area, years of experience number of patients they see per day their specialization, if they give treatment to children and family members, if they got training on parafunctional oral hygiene and orthodontic problems.

We also looked at pediatricians knowledge, their attitude, and practices related to problems and parafunctional oral dental hygiene in children. We used percentage frequencies to describe the data. A significance level of $p<0.05$ was approved.

Result

A total of 210 physicians participated in this study. The majority of respondents were male (59.0%), while females accounted for 41.0% of the sample as shown in Table-I

Factor	Category	Good Knowledge n (%)	p-value	Good Attitude n (%)	p-value	Good Practice n (%)	p-value	Good Combination	p-value
Gender	Male (n=112) (59.0%)	58 (51.8%)	**0.44**	95 (84.8%)	**0.27**	48 (42.9%)	**0.63**	38 (33.9%)	**0.51**
	Female (n=98) (41%)	51 (52.0%)		87 (88.8%)		53 (54.1%)		41 (41.8%)	
Experience	0-5 years (n=145)	74 (51.0%)	**0.58**	126 (86.9%)	**0.21**	65 (44.8%)	**0.015***	51 (35.2%)	**0.033***
	5-10 years (n=45)	20 (44.4%)		40 (88.9%)		25 (55.6%)		18 (40.0%)	
	>10 years (n=20)	15 (75.0%)		16 (80.0%)		11 (55.0%)		10 (50.0%)	
Workplace	Teaching hospital (n=130)	68 (52.3%)	**0.88**	113 (86.9%)	**0.31**	55 (42.3%)	**0.002***	45 (34.6%)	**0.047***
	Public hospital (n=50)	23 (46.0%)		41 (82.0%)		24 (48.0%)		15 (30.0%)	
	Private Clinic (n=30)	18 (60.0%)		28 (93.3%)		22 (73.3%)		19 (63.3%)	

Chi-square test *p<0.05

Table-I: Assessment of Pediatricians' Demographics and Professional Background with Their Knowledge, Attitude, Practice, and Combined Approach to Pediatric Malocclusion and Oral Habit Management

Questions related to healthcare Assessment and referral pattern among healthcare professionals are given in Table-II.

Variables (Question)	Response	n (%)
Do you perform oral examination as part of general physician examination?	Yes No	150 (71.4) 60 (28.6)
When first oral health examination should be perform (if yes in last question)?	Immediately after birth Age 0-2 years ≥ 2 years	170 (81.0) 35 (16.7) 5 (2.3)
How often are you recommended oral health examination by General Dentist?	Every 6 months Every year If any problem	130 (61.9) 60 (28.6) 20 (9.5)
Find abnormal oral habit and crooked teeth?	General dentist Pediatric dentist Orthodontist Prosthodontist	130 (61.9) 50 (23.8) 20 (9.5) 10 (4.8)

Table-II: Oral Healthcare Assessment Practices and Referral Patterns Among Healthcare Providers

The knowledge and practices of responders about malocclusion are compiled in Table-III.

Questions	Response	n (%)
What do you understand by malocclusion?	Crooked Teeth Abnormal Teeth shape Missing Teeth Extra Teeth	111(52.9) 91 (43.3) 16 (7.6) 27 (12.9)
Do you refer your patients to the orthodontist when you see a mismatch in jaws or dental malocclusion?	Yes No	196 (93.3) 14 (6.7)
Children with abnormal oral habits are more likely to develop malocclusion?	Strongly Agree Agree Neutral Disagree Strongly Disagree	150 (71.4) 80 (38.1) 20 (9.5) 10 (4.8) 4 (1.9)
Parafunctional habits means?	Abnormal Habits Normal but Excessive Normal Habits	155 (73.8) 120 (57.1) 45 (21.4)
Development of malocclusion depends upon (multiple selections allowed)	Thumb sucking Prolonged pacifier use Long-term bottle feeding Breastfeeding >2 years Mouth breathing Tongue tie/abnormal frenum	200 (95.2) 180 (85.7) 160 (76.2) 120 (57.1) 110 (52.4) 90 (42.9)

Table-III: Respondents' Knowledge and Practices on Malocclusion (n = 210)

The knowledge and awareness of participants about orthodontic therapy is shown in Table-IV

Questions	Responses	Frequency n (%)
Orthodontics deals with (you can Select multiple)	Crooked Teeth Missing Teeth Artificial Teeth Developing Jaw Problems	173 (82.4%) 100 (47.6%) 126 (60%) 116 (55.2%)
Where did you first hear about orthodontic treatment?	My Dentist Friend Family Internet	126 (60%) 110 (52.4%) 89 (42.4%) 79 (37.6%)
Do you have any first-degree relatives or people you know who have had orthodontic treatment?	Yes No	152 (72.4%) 58 (27.6%)
What do you think when should be the time of the first orthodontist examination of a child?	Before eruption of deciduous teeth Once first deciduous teeth erupted Once first permanent teeth erupted One all permanent teeth erupted	32 (15.2%) 74 (35.2%) 63 (30%) 41 (19.5%)

Table-IV: Distribution of Participants' Responses Regarding Knowledge and Awareness of Orthodontic Treatment (N = 210)

The distribution of oral disorders and their correlation with systemic symptoms in children who snore and open mouth breathing are shown in Table-V.

Malocclusion, namely misalignment of the front teeth (65.7%), was noted by a significant majority of respondents as the most prevalent condition in these youngsters; carious teeth, eruption issues, and tooth loss were mentioned less frequently. Gingival swelling, dental caries, oral mucosal lesions, crooked teeth, and movable teeth, as well as ailments including dry mouth, cleft lip and palate, and oral cancer, were frequently observed during oral examinations. Additionally, the majority of participants (86.7%) recognized a connection between systemic diseases and oral symptoms, indicating understanding of the possible link between respiratory issues and children's oral health.

Questions	Responses	Frequency n (%)
Children with snoring and breathing problems (mouth breathing) are more prone to?	Front teeth not matching (malocclusion) Carious teeth Teeth eruption problems Teeth loss	138 (65.7%) 32 (15.2%) 28 (13.3%) 12 (5.7%)
Oral manifestations/ features can examine in oral examination (you can select Multiple)	Swelling of gums Dental caries Oral mucosa ulcers, white spots, pigmentation Mobile teeth Dry mouth or excessive salivation Crooked teeth Cleft lip and palate Oral Cancer	175 (83.3%) 168 (80%) 162 (77.1%) 150 (71.4%) 148 (70.5%) 160 (76.2%) 145 (69%) 120 (57.1%)
Do you find association between oral manifestation and systemic conditions in your patient?	Yes No	182 (86.7%) 28 (13.3%)

Table-V: Frequency and Percentage Distribution of Oral Conditions, Manifestations, and Their Association with Systemic Conditions in Children with Snoring and Mouth Breathing (N = 210)

The knowledge and practices of paediatricians about oral health observations and their relationship to systemic problems in children are shown in Table-VI.

Questions	Response	Frequency n (%)
Do you find association between oral manifestation and systemic conditions in your patient?	Yes No	182 (86.7%) 28 (13.3%)
Do you think mismatch of jaws growth need further evaluation?	Yes No	110 (52.4%) 100 (47.6%)
Do you think, Pediatricians play an important role in recognition and prevention of malocclusion and parafunctional oral habits in children	Yes No	200 (95.2%) 10 (4.8%)

Have you attended workshop on orthodontic problems in children and the approaches to be applied?	Yes No	70 (33.3%) 140 (66.7%)
Do you want to attend workshop for knowledge and information about parafunctional oral habits and prevention of malocclusion?	Yes No	205 (97.6%) 5 (2.4%)

Table-VI: Distribution of Oral Health Observations and Related Findings among Children

Discussion

This study was carried out to highlight the necessity of strengthening the bond between pediatricians and orthodontists, as well as to address the areas in which doctors need to increase their understanding of orthodontic issues and acknowledge the significance of orthodontics. This study coincides with another study the purpose of this study is to evaluate the oral health knowledge, attitudes, and patient-care practices of pediatricians and pediatric residents. It gathered information on oral health behaviors, attitudes, and knowledge. Based on participants' answers to the practice questions, an oral health practice score was developed, and its variables were evaluated using linear regression. The chi-square test was used to examine the frequencies of oral health habits, attitudes, and knowledge between the two groups. 218 pediatricians and residents in all were polled. The general level of oral health awareness was low, while pediatricians had a better level (10.0±1.9) than residents (8.2±2.5). The percentage of respondents who agreed with the statements "Limited time with patients makes it difficult to integrate oral health into primary care practice" (66.3%) and "Primary healthcare physicians should know their local dentists to facilitate dental referral and treatment" (87.4%) varied.[12]

This research sought to determine how well-informed pediatricians were about mouth breathing and its orthodontic consequences, as well as how their treatment philosophies and clinical backgrounds affected referral practices. The majority of pediatricians (73.6%) knew that mouth breathing is linked to craniofacial problems, however only 14.5% knew about some orthodontic treatment methods including maxillary expansion. Just 25.5% of respondents said they regularly referred patients for orthodontic examination, despite the fact that 97.6% said they wanted more training. Both clinical experience ($p = 0.004$) and orthodontic treatment attitude scores ($p = 0.004$) were substantially correlated with referral behavior, while awareness scores ($p = 0.12$) were not.[13]

A cross-sectional study was conducted to assess the knowledge, perceptions, and practices of Syrian pediatricians concerning children's oral health. The six primary sections of the questionnaire asked questions about demographics, oral health-related knowledge, behavior, perceptions, and training. 43.12% of respondents (229/531) responded. The majority of participants (64.02%) had low levels of knowledge, and there was no significant correlation between years of experience and knowledge level ($p = 0.270$). The majority of participants (99.13%) believed that the etiological factors of dental caries were exposure to sugar, microorganisms, and nutrition. The vast majority of participants (98.25%) agreed that additional oral health education during residency was necessary.[14] Pediatricians and pediatric residents who treat children in Kuwait. Nevertheless, over two-thirds lacked knowledge about oral trauma treatment and preventive dental procedures. On the questions about preventive measures, just 16.5% of respondents received a satisfactory knowledge score, but on the questions about recent anticipatory guidance, approximately 51% received a satisfactory knowledge score. It is strongly advised to have enough oral health knowledge and training.[15]

In Orthodontics, malocclusion is one of the most common oral health issues. The most

common types of malocclusion are increased over jet, mal-alignment of teeth, AOB, Deep bite, Cross-bite. Malocclusion development has been associated with non-nutritive sucking habits (NNSHs), such as digit-sucking habits (DSHs) and pacifier-sucking habits (PSHs). A systematic review and meta-analysis was done to ascertain how patients who suck their digits and those who suck their pacifiers differ in the occurrence and development of anterior open bite and posterior cross bite.[16] The orthodontic impact of premature loss of deciduous teeth on malocclusion in permanent dentition has not been adequately addressed in the literature, even though it represents a critical factor in the management and treatment considerations associated with early childhood caries (ECC).[17]

In a study, a representative sample of adult Americans was used to evaluate the impact of orthodontic treatment on dental caries experience, prevalence, and severity in later life. In 19.62% of the adults, orthodontic treatment history was disclosed. Approximately 21.09% of individuals satisfied the aggregate DFT threshold for severe caries (DFT > 12), and 94% of participants had at least one filled or decaying tooth (DFT > 0). A reported history of orthodontic treatment was observed to significantly reduce the risks of DT > 0, DT > 2, FT > 11, and DFT > 12 (odds ratios (OR) = 0.41, 0.36, 0.74, and 0.60, respectively) after adjusting for confounding variables.[18] The majority of pediatricians (73.6%) understood the connection between mouth breathing and craniofacial problems, however only 14.5% knew about certain orthodontic treatment methods such maxillary expansion. Just 25.5% of respondents said they regularly referred patients for orthodontic examination, despite 70.9% expressing a desire for additional training. Referral behavior was substantially correlated with orthodontic treatment attitude scores ($p = 0.004$) and clinical experience ($p = 0.004$), but not with awareness scores ($p = 0.12$).[19]

The present findings align with previous studies showing that, despite awareness of orthodontic risk factors, gaps remain in clinical practice and referral behavior among pediatric healthcare providers.[12–15,19] This underscores the need for continued orthodontic education and collaboration between pediatricians and orthodontists.

The present findings are consistent with previous studies identifying oral habits, mouth breathing, and early tooth loss as important risk factors for malocclusion.[13,16,17,19] Participants showed good awareness of these factors and expressed a need for further training, highlighting the importance of continuous education and collaboration with orthodontists.[13–15,19]

Conclusion

- Gender showed no significant association with knowledge, attitude, practice, or overall performance. Experience significantly influenced practice and combined scores but not knowledge or attitude.
- Workplace setting significantly affected practice and overall performance, with private clinic practitioners achieving the highest scores. However, workplace had no significant impact on knowledge or attitude.
- Healthcare providers demonstrated generally good oral health and orthodontic awareness, routinely performing oral examinations, recognizing the importance of early assessment, identifying risk factors for malocclusion, and making appropriate dental referrals.
- Most participants acknowledged the relationship between oral habits, malocclusion, and systemic health conditions in children, recognized the pediatrician's role in prevention and early detection, and expressed strong interest in further professional training.

Limitations

The limitation of the current study was based on its cross-sectional nature, which limits the capability of establishing cause-effect relationships. The data were collected using a questionnaire that was self-administered, making the data susceptible to information bias. The sample was restricted to certain healthcare sectors, which may not be generalizable to all pediatricians. Unequal distribution of experience levels may have impacted the findings. Skills were not clinically assessed, and the data were based on self-reporting.

Ethical Approval

The study was approved by the Multan Ethical Board of CIMS Dental College (Ref: 2133/Trg/20MDC/CDC).

Disclaimer

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Conflict of Interest

It is declared that the authors don't have any conflict of interest.

Authors' Contribution

AW: Write up and data collection
ZA: Re-view and data conformation
MR: Statistics analysis
MA: Data Collection

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