

Educational Intervention on Pediatricians' Knowledge, Attitude and Practice on Child Oral Health: A Hospital Based Longitudinal Study

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Abstract

Background: Pediatricians provide multiple early childhood screenings and are in a privileged position to promote child oral health by enacting timely dental referrals. Our primary objective included assessing the pre- and post-educational intervention knowledge, attitude and practice of pediatricians on child oral health. The secondary objective included the assessment of prevalence of oral health problems in children attending Pediatrics out-patient department (OPD).

Methods: This one-year hospital based longitudinal study involved conveniently selected 400 children (6 months to 14-years-old) from Pediatrics OPD and 12 pediatricians (complete enumeration) from a university hospital, BPKIHS, Dharan, Nepal. Screening for oral health problems in children was performed. Pre- and post-educational intervention knowledge and attitude towards child oral health of the pediatricians were assessed using a validated questionnaire. The practice component was assessed through pre-questionnaire and pre- and post-intervention dental referral paper practice. Data analysis included descriptive statistics, chi-square and paired t-tests.

Results: Educational intervention significantly increased the knowledge score of the pediatricians but not their attitude ($p = 0.72$) or the paper dental referral practice. Oral health problems were observed in 59.3% of the children attending pediatrics OPD, dental caries being the most prevalent (49.9%).

Conclusion: More than half of the children attending pediatrics OPD had oral health problems. Educational intervention was effective in improving pediatricians' knowledge but not their attitude and the paper dental referral practice.

Keywords: Children; Educational intervention; Knowledge; Oral health problem; Pediatrician

Declarations

Ethics approval and consent to participate: This study was conducted with prior ethical approval from Institutional Review Committee of BPKIHS (Reference no.Acd.260/070/071) and informed consent had been obtained from participants prior to the enrollment.

Consent for publication: Informed consent was obtained from the patients for the publication of manuscript.

Availability of data and materials: The full data set supporting this research will be submitted to the journal or be available upon request by the readers.

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Oral problems lead to major health burden affecting all aspects of life [1, 2]. Oral health has been one of the most neglected health care needs in developing countries like Nepal [3]. Dental caries, gingivitis, malocclusion, soft tissue pathology and traumatic dental injury are commonly seen oral problems in children [4 - 9]. Among them, dental caries persists to be the most common chronic and infectious disease in children globally [5]. According to the global burden of disease 2017, more than 530 million children suffer from dental caries of primary teeth [10]. In addition, untreated dental caries in permanent teeth is the most common health condition [10].

Factors affecting timely dental treatment in children include parental awareness on oral health, perceptions of need, lack of access, dental anxiety, financial costs and referral from primary health care practitioners [11, 12]. Many children present to the dentist with established dental diseases, when surgical management becomes the only choice [13]. The majority of the oral health problems is largely preventable. However, if not treated on time, children have to suffer physically, mentally and socially [14, 15].

Pediatricians can prevent oral health problem begins as they frequently encounter children in earlier years. Their timely dental referral can help children attain sound oral health throughout their life. The early and regular dental visits provide children with marvelous benefits such as establishment of a dental home and a family pediatric dentist back-up, inculcation of good oral hygiene habits since early age, minimization of dental caries risk for lifetime and elimination of the vicious cycle of dental fear and anxiety [16, 17]. Studies have proven that children prevented from early childhood caries in their first few years showed much lesser propensity for caries development in their later years when the colonization of cariogenic bacteria in their mouth becomes more competitive and difficult [16, 17]. The American Academy of Pediatrics (AAP) and American Academy of Pediatric Dentistry (AAPD) have recommended the primary health care practitioners such as pediatricians to refer infants for their first dental visit within six months of eruption of the first primary tooth but by no later than 12 months of age [16, 17, 19]. This integration of oral health into primary health care through interprofessional learning and collaborative approaches and closed-loop referral processes provides better accessibility and availability of dental care [20]. Numerous studies have evaluated

pediatricians' knowledge, attitude, and practice (KAP) on child oral health [21 - 29]. However, research evaluating the impact of educational interventions on pediatricians' KAP is lacking. Hence, this study was done to assess the pediatricians' pre- and post-educational intervention KAP on children's oral health and the prevalence of oral health problems in children attending Pediatrics OPD.

METHODS

A hospital-based longitudinal study was conducted from 2012-2013 among conveniently selected 400 children aged six months to 14 years attending Pediatrics OPD, and 12 pediatricians (complete enumeration) at B. P. Koirala Institute of Health Sciences (BPKIHS), Dharan, Nepal. Children from six months of age were included in the study as eruption of teeth begins at this age and thus the associated common oral problems. Non-Nepalese, non-ambulatory patients and parents who declined participation were excluded. Data collection began only after ethical clearance from the Institutional Review Committee of BPKIHS and obtaining written informed consent from the parent/caregiver.

To determine the sample size, the formula $n = z^2pq/d^2$ was used with a prevalence of 35.6% [30], 95% confidence and 5% precision. An extra 17.5% of the calculated sample of 340 were added to cover the potential biases. The oral clinical examination of children was done by a single qualified dental examiner in a separate room in the Pediatrics OPD using the dental survey instruments where the patients were directed post their pediatrician check-up. Six oral health problems: dental caries, gingivitis, malocclusion, soft tissue pathology (extraoral/intraoral), traumatic dental injury and abnormal oral habits were assessed for their presence or absence based on associated clinical findings. Dental caries was recorded using decayed, extracted and filled index (deft) and decayed, missing and filled index (DMFT). The child was considered to be positive for the presence of oral health problem even with the presence of any one of the six oral problems. The clinical findings were further confirmed with the history taking as and when required from the child and the parent/ caregiver. The presence of dental referral paper practice of the pediatricians was also observed on the patient's card.

After assessing half of the sample, i.e., 200 patients in the Pediatrics OPD for oral health problems,

a one-day educational intervention (two-hour seminar) was conducted for the pediatricians focusing on promotion of child oral health. The topics discussed were dental caries in children, etiology and risk factors for caries and dental referral practice according to the guidelines proposed by AAP and AAPD. Self-reported questionnaire surveys were done before and after the educational intervention using a standardized questionnaire [13]. Pre-questionnaires assessed the KAP of pediatricians before educational intervention while post-questionnaires assessed their knowledge and attitude after the intervention. The questionnaire included a total of six questions each assessing knowledge and attitude and eight questions assessing the practice of the pediatricians. Same set of questions was used post-intervention as well for assessing KAP of pediatricians (**Tables 1, 2 and 3**). The response was assessed by using a scoring system, where scores were based on correct answers. For the knowledge and practice items, the right answer was coded as 1 and the wrong answer as 0. For the attitude items, score 1 coding indicated a positive attitude while score 0 indicated a negative attitude. The individual scores were then summed up to yield a total score. Maximum possible scores for KAP were 6, 6 and 8 respectively. The oral screening of children attending the pediatrics OPD for the selected six oral health problems, and observance of pediatricians' dental referral paper practice on the patient's card was continued for the remaining 200 patients after the educational intervention.

Collected data was entered in Microsoft excel 2007 and converted into statistical package for social sciences (SPSS) version 11.5. Data analysis included descriptive statistics and inferential statistics (paired t-test and McNemar Chi-square test) to find out differences between pre- and post-knowledge and attitude evaluation of the pediatricians and association of dental caries with age group and gender at 95% confidence interval when $p \leq 0.05$.

RESULTS

Out of the 12 pediatricians, 10 (83.3%) had less than four-years' of experience in pediatric practice. The majority (91.7%) reported seeing more than 30 patients per week. A total of 83.3% pediatricians were educated about oral health during medical school, 25% during residency and 16.7% through Continuing Medical Education (CME). Post-intervention, we observed an

Table 1: Responses to questions assessing knowledge of pediatricians before and after educational intervention. Values are presented as number (%).

Questions	Correct response n (%)	
	Pretest	Posttest
Does bottle feeding cause dental caries?	7 (58.3)	12 (100)
Does Nursing on demand cause dental caries?	0	8 (66.7)
Does transmission of oral bacteria take place between mother and child?	7 (58.3)	11 (91.7)
Is dental caries a genetic disease?	3 (25)	5 (41.7)
Does fluoride decrease dental caries?	10 (83.3)	12 (100)
What age does AAP and AAPD recommend first dental visit?	11 (91.7)	12 (100)

*Mann-Whitney U test

Table 2: Responses to questions assessing attitude of pediatricians before and after educational intervention. Values are presented as number (%).

Questions	Correct response n (%)	
	Pretest	Posttest
Do you think pediatricians should assess teeth for dental problems?	12 (100)	11 (91.7)
Do you think pediatricians should counsel on prevention of dental problems?	12 (100)	12 (100)
Do you think pediatricians should refer every child to dentist at 12 months of age or within 6 months of eruption of first tooth?	10 (83.3)	12 (100)
Do you think pediatricians should assess patient's caries risk status?	11 (91.7)	10 (83.3)
Do you think pediatricians should assess oral health problems other than dental caries?	12 (100)	11 (91.7)
Are you interested in CME courses on oral health?	12 (100)	12 (100)

CME: Continuing Medical Education

improvement in knowledge on the causes of dental caries like bottle feeding and nursing on demand, transmission of oral bacteria between mother and child, dental caries not being a genetic disease, fluoride preventing dental caries, and AAP and AAPD recommended age for the first dental visit (**Table 1**). Prior to the intervention, eleven pediatricians were already aware that the child's first dental visit should be no later than by first year of age.

All the participants responded positively to the attitude related questions asking information about

Table 3: Responses to questions assessing practice of pediatricians on child oral health. Values are presented as number (%).

Questions	Categories	n (%)
How often do you see child with dental caries?	Once	7 (58.3)
	> Once	5 (41.7)
Do you inquire about bottle in bed?	Yes	10 (83.3)
	No	2 (16.7)
Do you examine a child's teeth for cavities?	Yes	7 (58.3)
	No	5 (41.7)
Do you counsel on going to a dentist?	Yes	5 (41.7)
	No	7 (58.3)
Do you counsel on importance of tooth brushing?	Yes	9 (75)
	No	3 (25)
Do you ask for the use of fluoridated toothpaste?	Yes	4 (33.3)
	No	8 (66.7)
Do you inquire about mother's dental health?	Yes	1 (8.3)
	No	11 (91.7)
Do you discuss effects of diet on oral health?	Yes	6 (50.0)
	No	6 (50.0)

their counseling on prevention of dental problems, referral of every child to dentist at 12 months of age or within 6 months of eruption of first tooth, and interest in CME courses on oral health (**Table 2**). However, the number of positive responses of the participants decreased when asked about their opinions regarding assessment of teeth for dental problems, assessment of patient's caries risk status and assessment of oral health. The responses to the attitude-related questions did not show any statistically significant difference following the intervention.

Five (41.7%) pediatricians reported seeing children with dental caries more than once in their practice (**Table 3**). Ten (83.35%) inquired about bedtime bottle feeding habit of children. Seven (58.3%) out of 12 participants said that they examined child's teeth for cavities while 5 (41.7%) counseled on going to a dentist. Nine (75%) of them counseled on the importance of tooth brushing, 4 (33.3%) asked for the use of fluoridated toothpaste and 6 (50%) even discussed the effects of diet on oral health. Only one respondent inquired about mother's dental health.

The knowledge score (mean \pm Standard Deviation (SD)) significantly increased from 3.67 ± 0.88 to 5.17 ± 0.83 ($p < 0.001$) while a slight decrease in their positive attitude (mean \pm SD) from 5.75 ± 0.45 to 5.67 ± 0.88 was observed ($p = 0.72$) following intervention. The

practice score (mean \pm SD) was 4.08 ± 1.92 .

Among the 400 children examined, 243 (60.8%) were male and 157 (39.2%) were female. The distribution of the children according to their age group was classified as less than one year (48, 12%), 1 - 3 year (101, 25.3%), 3 - 6 year (103, 25.8%), 6 - 9 year (63, 15.8%), 9 - 12 year (60, 15%) and 12 - 14 year (25, 6.3%).

The prevalence of oral health problems in children visiting Pediatrics OPD, BPKIHS was found to be 59.3% with dental caries as the most prevalent problem (49.9%) followed by gingivitis (26.5%), malocclusion (20%), soft tissue pathology (6%), traumatic dental injury (1.5%) and abnormal oral habits (1.5%) (**Table 4**).

Out of the 400 participants examined, 25 had no teeth erupted in their mouth and hence caries was assessed from the remaining 375 children. Dental caries was significantly associated with age ($p = 0.003$) and was seen in less than one year (7.48%), 1 - 3 year (15.5%), 3 - 6 year (32.08%), 6 - 9 year (17.11%), 9 - 12 year (19.78%), 12 - 14 year (8.02%). Males were more affected by caries (64.17%) as compared to females (35.83%) but the difference was not found to be statistically significant ($p = 0.18$).

The mean deft was 2.25 and mean DMFT was 0.23 (**Table 5**). The caries prevalence in the primary and permanent dentition was 47.46% and 20.27%, respectively.

However, the dental referral paper practice remained low (total 8 referrals) and unchanged pre- and post-educational intervention (**Fig. 1**). The barriers perceived by the pediatricians were lack of knowledge on child oral health (50%), child of age less than three years (16.7%), and parental lack of compliance (16.7%).

DISCUSSION

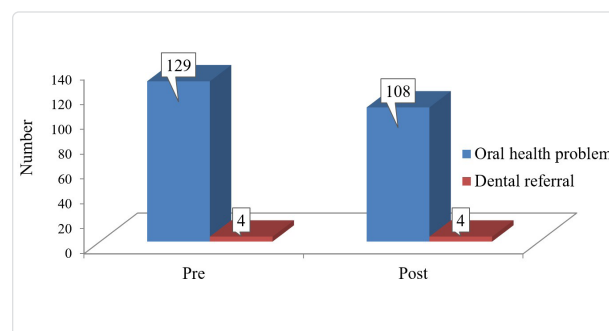


Figure 1: Oral health problems and dental referral by the pediatricians pre- and post-educational intervention

In Nepal, two-thirds of the children are still deprived of at least one of the seven basic needs [31]. The protocol of routine medical and dental check-ups has not yet been streamlined in Nepal. The problem is seen more for oral health despite oral diseases being highly prevalent in children and adolescents [32]. Since pediatricians provide early multiple childhood screenings, their timely dental referrals have shown to motivate and reinforce the patients to visit dental clinics routinely [18]. Educational intervention such as interactive workshop is an effective method to increase knowledge and change behaviors of primary care providers in improving the oral health [33].

We found that the majority of the pediatricians (83.3%) acquired oral health education during their medical school, followed by residency and CME. The integration of oral health education into medical school curriculum and during residency programs can greatly help for better interprofessional learning and collaborative practices to be implemented to improve the overall health of children since their early years.

In our study, most of the pediatricians were aware about the recommended age for first dental visit. All the pediatricians agreed that they should counsel on prevention of dental problems and refer the child for their first dental visit according to the guidelines along with 100% showing an interest in CME on oral health. This is in agreement to other reports [13, 21]. In the present study, more than half of the pediatricians (58.3%) examined child's teeth for cavities in their practice and almost half of them (41.7%) counseled patients on going to the dentist as reported by similar other studies [13, 21].

There are numerous studies assessing KAP of pediatricians showing limited to good knowledge and good attitude but with little to good practice on child oral health promotion [21 - 29]. However, only few studies have assessed the actual practice of pediatricians especially in the areas involving child oral health with appropriate counseling and timely dental referrals [22]. Furthermore, studies assessing KAP of pediatricians involving educational intervention on child oral health are lacking. The present study showed that the educational intervention increased the knowledge of the pediatricians significantly. However, there seemed a less positive attitude towards child oral health promotion and the actual practice of referral was quite low which remained unchanged even after the educational intervention. In this study, the paper dental referrals made were mainly for dental caries,

gingivitis, soft tissue pathology and malocclusion which could be attributed to the existing knowledge of the pediatricians on oral health or as per patient's addressing their oral problems themselves. However, the findings of this study showed that the practice of dental referral for first dental visit of a child was yet not applicable among the pediatricians.

The pediatricians' perceived barriers such as lack of knowledge on child oral health, child of age less than three years and parental lack of compliance could be attributing factors to their minimal dental referral of the patients in the present study. Similar finding was observed in a study by Lewis et al. conducted among 1618 post residency fellows of the AAP where lack of training (41%) was reported as the most common barrier to pediatricians' dental referral [23]. Other reported barriers included uninsured and Medicaid insurance, parental lack of compliance to recommended referral, the patient being less than 2 years old, inadequate education and training, time constraints in practice, lack of referral pathways as barriers for pediatricians, costs, long waiting times for dental treatment and lack of dental providers that were willing to see infants and young children, a dental emergency, being medically/behaviorally compromised [13, 25, 28]. However, authors suggest increasing the confidence of the practitioners with clinical trainings on early caries detection and risk assessment can prove more beneficial than theoretical classes or seminars for identifying the high caries risk and appropriate dental referrals [22].

In the present study, we found more than half of the children (59.3%) were affected by one or the other oral health problems, dental caries being the most prevalent (49.9%). This is in agreement with the global evidence [30, 34 - 36]. Caries prevalence was higher in primary dentition (47.46%) than the permanent dentition (20.27%) which was similar to many other studies [34 - 36]. Reasons for decrease in the caries in permanent dentition could be attributed to increased awareness of oral hygiene with increasing age [37].

Also, this study showed the presence of dental caries among very young group of children as early as one year; though the prevalence was not found to be associated significantly with gender. Dental caries was much more profound in the age group of 3 - 6 years (32.08%; $p = 0.003$) which was similar to a study by Khanal S et al. conducted among 468 school children aged 5 - 16 years in Nepal with a caries prevalence of

Table 4: Prevalence of oral health problems. Values are presented as number (%).

Oral health problems	n (%)	Findings	n (%)
Dental caries	187 (49.9)	Decayed	184 (49.1)
		Missing	13 (3.5)
		Filled	18 (4.8)
Gingivitis	106 (26.5)	Plaque	102 (25.5)
		Calculus	20 (5)
		Gingival swelling	22 (5.5)
		Gingival bleeding	10 (2.5)
Malocclusion	80 (20.0)	Crowding	65 (16.3)
		Proclined teeth	4 (1)
		Crossbite	7 (1.8)
		Edge to edge bite	7 (1.8)
		Spacing	6 (1.5)
Soft tissue pathology	24 (6.0)	Swelling	3 (0.8)
		Sinus	7 (1.8)
		Abscess	2 (0.5)
		Others (palpable lymph nodes, aphthous ulcers, cleft lip and palate)	13 (3.3)
Traumatic dental injury	6 (1.5)	Chipped/ broken tooth	4 (1)
		Discoloration	1 (0.3)
		Others (avulsed, mobile)	2 (0.5)
Abnormal oral habits	6 (1.5)	Thumb sucking	1 (0.3)
		Nail biting	3 (0.8)
		Mouth breathing	1 (0.3)
		Others (lip biting)	1 (0.3)

Table 5: Mean decayed, missing, and filled teeth in primary and permanent dentition. Values are presented as mean and SD.

Dentition	Variable	Mean	SD
Primary	deft	2.25	3.383
	d	2.15	3.319
	e	0.05	0.289
	f	0.05	0.279
Permanent	DMFT	0.23	0.794
	D	0.22	0.756
	M	0	0
	F	0.02	0.158

*SD: Standard Deviation. DMFT/deft: Decayed/decayed, Missing/extracted or extraction needed, Filled/filled index

60.7% and 39.3% in 5 - 10 years and 11 - 15 years age group children respectively [35]. However, the finding was in contrast to a study by Adhikari S et al. conducted among 360 school children aged 3 - 14 years in Nepal which showed caries prevalence highest in 7 - 12 years old children (89.2%) followed by 13 - 14 years olds (84.72%) and 3 - 6 years old (77.33%) [38]. Caries

affliction in such young children can be attributed to the sugary diets and medicated syrups with lack of proper oral hygiene measures yet established. This early childhood caries can have adverse impact on their overall health which mandates early dental interventions. A timely dental referral according to the guidelines is therefore, deemed of great importance.

Our study has several limitations. Firstly, the sample for prevalence of oral health problems in the hospital does not represent a true sample from community. Secondly, as the sample size of the pediatricians was also small and the study was conducted at a single institution, its generalizability to other settings may be limited. Thirdly, the questionnaire surveys were conducted immediately after the educational intervention, limiting the ability to examine any change in knowledge or attitude that could have occurred during the active intervention time. Fourthly, a single educational intervention could not provide the expected outcomes in regard to the knowledge, attitude and practice. Hence, future studies in a larger sample size, preferably a multicentric one might prove more helpful in identifying any hidden barriers. Additionally, such studies should focus on exploring potential

interventions for increasing effective dental referrals by pediatricians. The study's strength is that it is the first of its kind in Nepal that involved educational intervention among the pediatricians to instill awareness on child oral health and encourage appropriate timely (first dental visit) dental referrals.

CONCLUSION

More than half of the children attending Pediatrics OPD had oral health problems. Educational intervention was effective in improving pediatricians' knowledge. However, their attitude and the paper dental referral practice did not show any improvement even after the intervention.

References

- Peres MA, Macpherson LM, Weyant RJ, Daly B, Venturelli R, Mathur MR, et al. Oral diseases: a global public health challenge. *Lancet*. 2019;394(10194):249-60. DOI: 10.1016/S0140-6736(19)31146-8
- Krol DM. Children's oral health and the role of the pediatrician. *Curr Opin Pediatr*. 2010;22(6):804-8. DOI: 10.1097/MOP.0b013e3283402e3b
- Knevel RJ, Neupane S, Shrestha B, de Mey L. Buddhi Bangara Project on oral health promotion: a 3- to 5-year collaborative programme combining support, education and research in Nepal. *Int J Dent Hyg*. 2008;6(4):337-46. DOI: 10.1111/j.1601-5037.2008.00345.x
- National Oral Health Policy 2070- Nepal. [cited 15 June 2022] Available from: <https://publichealthupdate.com/national-oral-health-policy-2070-nepal/#:~:text=The%20goal%20of%20the%20National,health%20amongst%20the%20Nepalese%20people>.
- World Health Organization. Oral Health Fact Sheet. Geneva, Switzerland:WHO; 2012.
- Karki S, Laitala ML, Humagain M, Seppanen M, Pakkila J, Anttonen V. Oral health status associated with sociodemographic factors of Nepalese schoolchildren: a population-based study. *Int Dent J*. 2018;68(5):348-58. DOI: 10.1111/idj.12393
- Batra P, Saini P, Yadav V. Oral health concerns in India. *J Oral Biol Craniofac Res*. 2020;10(2):171-4. DOI: 10.1016/j.job-cr.2020.04.011
- Zou J, Meng M, Law CS, Rao Y, Zhou X. Common dental diseases in children and malocclusion. *Int J Oral Sci*. 2018;10(1):7. DOI: 10.1038/s41368-018-0012-3
- Halwai HK, Bhat PK, Shekhar M, Yadav B. Oral health status and treatment needs among 12 and 15-year-old government and private school children in Rupandehi District (Bhairahawa) Nepal. *Journal of Universal College of Medical Sciences*. 2014;2(3):15-9. DOI: 10.3126/jucms.v2i3.11822
- GBD 2017 Disease and Injury Incidence and Prevalence Collaborators. Global, regional, and national incidence, prevalence, and years lived with disability for 354 diseases and injuries for 195 countries and territories, 1990-2017: a systematic analysis for the Global Burden of Disease Study 2017 [published correction appears in *Lancet*. 2019 Jun 22;393(10190):e44]. *Lancet*. 2018;392(10159):1789-858. DOI:10.1016/S0140-6736(18)32279-7
- Freeman R. Barriers to accessing dental care: patient factors. *Br Dent J*. 1999;187(3):141-4. DOI: 10.1038/sj.bdj.4800224
- Prasad M, Manjunath C, Murthy AK, Sampath A, Jaiswal S, Mohapatra A. Integration of oral health into primary health care: A systematic review. *J Family Med Prim Care*. 2019;8(6):1838-45. DOI: 10.4103/jfmpc.jfmpc_286_19
- Ditto MR, Jones JE, Sanders B, Weddell JA, Jackson R, Tomlin A. Pediatrician's role in children's oral health: an Indiana survey. *Clin Pediatr (Phila)*. 2010;49(1):12-9. DOI: 10.1177/0009922809343718
- Tesch FC, Oliveira BH, Leao A. Mensuração do impacto dos problemas bucais sobre a qualidade de vida de crianças: aspectos conceituais e metodológicos [Measuring the impact of oral health problems on children's quality of life: conceptual and methodological issues]. *Cad Saude Publica*. 2007;23(11):2555-64. DOI: 10.1590/S0102-311X2007001100003
- Li MY, Zhi QH, Zhou Y, Qiu RM, Lin HC. Impact of early childhood caries on oral health-related quality of life of preschool children. *Eur J Paediatr Dent*. 2015;16(1):65-72. PMID: 25793957
- Hale KJ; American Academy of Pediatrics Section on Pediatric Dentistry. Oral health risk assessment timing and establishment of the dental home. *Pediatrics*. 2003;111(5 Pt 1):1113-6. DOI: 10.1542/peds.111.5.1113
- Section on Pediatric Dentistry and Oral Health. Preventive oral health intervention for pediatricians. *Pediatrics*. 2008;122(6):1387-94. DOI: 10.1542/peds.2008-2577
- Beil HA, Rozier RG. Primary health care providers' advice for a dental checkup and dental use in children. *Pediatrics*. 2010;126(2):e435-41. DOI: 10.1542/peds.2009-2311
- American Academy of Pediatric Dentistry. Policy on oral health care programs for Infants, children, adolescents, and individuals with special health care needs. *The Reference Manual of Pediatric Dentistry*. Chicago, Ill.:American Academy of Pediatric Dentistry; 2021:39-42.
- Nelson JD, Spencer SM, Blake CE, Moore JB, Martin AB. Elevat-

- ing oral health interprofessional practice among pediatricians through a statewide quality improvement learning collaborative. *J Public Health Manag Pract.* 2018;24(3):e19-e24. DOI: 10.1097/PHH.0000000000000622
21. Ismail AI, Nainar SM, Sohn W. Children's first dental visit: attitudes and practices of US pediatricians and family physicians. *Pediatr Dent.* 2003;25(5):425-30. PMID: 14649605
 22. dela Cruz GG, Rozier RG, Slade G. Dental screening and referral of young children by pediatric primary care providers. *Pediatrics.* 2004;114(5):e642-52. DOI: 10.1542/peds.2004-1269.
 23. Lewis CW, Boulter S, Keels MA, Krol DM, Mouradian WE, O'Connor KG, et al. Oral health and pediatricians: results of a national survey. *Acad Pediatr.* 2009;9(6):457-61. DOI: 10.1016/j.acap.2009.09.016
 24. Sezer RG, Paketci C, Bozaykut A. Paediatricians' awareness of children's oral health: knowledge, training, attitudes and practices among Turkish paediatricians. *Paediatr Child Health.* 2013;18(4):e15-9. DOI: 10.1093/pch/18.4.e15.
 25. Alshunaiber R, Alzaid H, Meaigel S, Aldeeri A, Adlan A. Early childhood caries and infant's oral health; pediatricians' and family physicians' practice, knowledge and attitude in Riyadh city, Saudi Arabia. *Saudi Dent J.* 2019;31(Suppl):S96-S105. DOI: 10.1016/j.sdentj.2019.01.006.
 26. Aburahima N, Hussein I, Kowash M, Alsalami A, Al Halabi M. Assessment of paediatricians' oral health knowledge, behaviour, and attitude in the United Arab Emirates. *Int J Dent.* 2020;2020:7930564. DOI: 10.1155/2020/7930564.
 27. Prathima GS, Kavitha M, Kayalvizhi G, Sanguida A, Suganya M, Arumugam S. Awareness, attitude, and practice of pediatricians regarding early childhood caries and infant oral healthcare of children in Puducherry- A cross-sectional survey. *Indian J Dent Res.* 2020;31(3):439-443. DOI: 10.4103/ijdr.IJDR_180_18.
 28. Dickson-Swift V, Kenny A, Gussy M, McCarthy C, Brackley-O'Grady S. The knowledge and practice of pediatricians in children's oral health: a scoping review. *BMC Oral Health.* 2020;20(1):211. DOI: 10.1186/s12903-020-01198-0.
 29. Oliveros-Villarico M, Flores KKR, de Guzman JCZ, Manrique ALV, Millo GA, Estrera KRP. Pediatrician knowledge, attitude and practices on children's oral health in a tertiary public hospital in the Philippines: a descriptive study. *Acta Med Philipp [Internet].* 2022 Aug 18 [cited 2022 Sep 3]. DOI: <https://doi.org/10.47895/amp.vi0.5323>
 30. Venugopal T, Kulkarni VS, Nerurker RA, Damle SG, Patnekar PN. Epidemiological study of dental caries. *Indian J Pediatr.* 1998;65(6):883-9. DOI: 10.1007/BF02831355
 31. Unicef Nepal. Children in Nepal. [cited 2 April 2022] Available from: <https://www.unicef.org/nepal/children-nepal>
 32. Department of Health Services. Ministry of Health and Population. Government of Nepal. Nepal Health Sector Programme- Implementation Plan (NHSP-IP) (2004-2009). Available from: <http://dohs.gov.np/plan-policies/>
 33. Sohn W, Ismail AI, Tellez M. Efficacy of educational interventions targeting primary care providers' practice behaviors: an overview of published systematic reviews. *J Public Health Dent.* 2004 Summer;64(3):164-72. DOI: 10.1111/j.1752-7325.2004.tb02747.x.
 34. Bhagat T, Shrestha A. Prevalence of dental caries among public school children in the Eastern Nepal. *JCMC.* 2014;4(1):30-2. DOI: <http://dx.doi.org/10.3126/jcmc.v4i1.10845>
 35. Khanal S, Bhattarai R, Rao GN, Shrestha S. Prevalence of Dental Caries among Primary School Children of Kathmandu District- A Pilot Study. *JCMC.* 2017;13(2):275-8. DOI: <https://doi.org/10.3126/jcmsn.v13i2.16335>
 36. Bastola BS, Koirala B, Dali M, Shrestha S, Baral D. Dental caries experience in 6-13 years old school children of Dharan sub-metropolitan city, Nepal: a cross-sectional study. *JNAPD.* 2021;2(1):12-8. DOI: <https://doi.org/10.3126/jnapd.v2i1.41559>
 37. Chu CH, Wong AW, Lo EC, Courtel F. Oral health status and behaviours of children in rural districts of Cambodia. *Int Dent J.* 2008;58(1):15-22. DOI: 10.1111/j.1875-595x.2008.tb00172.x.
 38. Adhikari S, Tamrakar L, Humagain M, Bhattarai R. Dental caries prevalence among 3 - 14 year old school children of Chitwan. *J.Nep Assoc Ped Dent.* 2021;2(1):19-23. DOI: <https://doi.org/10.3126/jnapd.v2i1.41596>