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Dentists knowledge and awareness of different infant feeding practices and their implications: A cross-sectional observational study

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***Abstract*---**Aim: To assess the knowledge and awareness of the benefits & risk of different infant feeding practices amongst dentists. Materials and methods: The present cross-sectional study was conducted among 205 dentists by using convenience sampling method. Results: 79.8% of the participants responded that breastfeeding should be initiated within 1 hour of birth whereas only 3.8% reported it to be initiated within 24 hours of birth. Around 78.8% of the participants had the knowledge about commencement of exclusive breastfeeding for 6 months after birth. 51.4% participants knew that breastmilk can provide one third of energy between 12 and 24 months. We found that 51.0% participants responded that pumped breastmilk can be stored for 4 hours at room temperature. Conclusion: There is a generalized lack of awareness regarding infant feeding practices among general dentists and most of them are not updated about the latest recommendations.

***Keywords*---**breastfeeding, infant feeding practices, dentists.

Introduction

Health care professionals including dentists play a key role in promotion and encouragement of breastfeeding among mothers as the ideal method of infant feeding in their general practice.1 “Breastfeeding is an unequalled way of providing ideal food for the healthy growth and development of infants; it is also an integral part of the reproductive process with important implications for the health of mothers. As a global public health recommendation, infants should be exclusively breastfed for the first six months of life to achieve optimal growth, development and health.2

Breast milk has anti-bacterial properties and a protective function. Breast milk is a key source of energy and essential fatty acids that provides substantial amounts of micronutrients. Breastfed children at 12-23 months of age receive 35-40% of total energy needs from breast milk.3 Breast milk contains secretory IgA (sIgA) that neutralizes infectious agents. It also contains enzyme lysozyme, which disrupts the proteoglycan layer of the bacterial cell wall thereby inhibiting their growth.4 Lactoferrin, is the most abundant proteins in human milk, also limits bacterial growth. Also, the IgA antibodies present in the milk interfere with the colonization of pioneer streptococci and other bacteria inhabiting the oral cavity.5 Breastfeeding can influence craniofacial development. Suckling movements during breastfeeding involve tongue peristaltic motions around the breast nipples that can guide palate morphology by rounding and flattening it (Woolridge 1986). It may also assist maturity and organization of the peripheral oral musculature required for effective swallowing (Palmer 1988).6

Breastfeeding may even encourage the growth in three-dimension direction: sagittal, transversal and vertical.7 Disturbances in the muscular forces of inner and external containment during breastfeeding can also lead to reduced vertical growth of the anterior portion of alveolar process, upper incisors proclination and anterior displacement of maxilla due to horizontal force, lower incisors retroclination or proclination due to the lower lip pressure to the tongue or even digital pressure.8 However, there is little evidence currently available in the literature associated with the knowledge of healthcare providers especially the dentists regarding different infant feeding practices and its importance in our society. Health care professionals can help by increasing breastfeeding initiation and continuation rates, by encouraging and supporting breastfeeding and providing appropriate care for breastfeeding couplets. Our study seeks to address this gap. Therefore, the present study was carried out to assess the knowledge and awareness about the benefits and risks of different infant feeding practices amongst the dentists.

Material and Methods

Ethical clearance: Prior to the start of the study, approval was taken from Scientific Committee and Institutional Ethics Committee of Dr. D.Y. Patil Vidyapeeth Pune, Dr. D.Y. Patil Dental College and Hospital Pimpri, Pune. (*Registration number: DPU/483/51/2021*)

Study design and population: The present cross-sectional study was conducted among dentists registered with Indian dental association in Pune to evaluate Knowledge and awareness of the benefits and risks of different infant feeding practices amongst dentists.

Questionnaire design: A questionnaire was first prepared by identifying the domains to be included in the questionnaire through the literature search. Domains considered were-Breastfeeding initiation, Exclusive breastfeeding, Human milk significance, Habits, Socioeconomic factors, Infant formula, breastfeeding adverse effects, bottle feeding adverse effects. Based on the above domains, the questions were framed and the initial draft of questions regarding KAP was prepared. The types of questions framed were closed ended. Validation of the questionnaire was done.

Data collection: The data was collected from the Dentists registered with the Indian Dental Association of Pune city. Convenience sampling method was used and sample size calculated was 205. Dentists registered with Indian Dental Association were included in the study whereas those who refused to participate were excluded. Email ids of the registered dentists were collected from the heads of the Indian Dental Association. The validated questionnaire was emailed to the respective email IDs of dentist. A follow-up reminder email was sent at monthly intervals for 6 months. Collection of data was done at the end of 6 months and results were analysed.

Statistical analysis: The data was transferred to a Microsoft excel spreadsheet-10. The data was analysed by statistician using IBM SPSS software version 21. The results were obtained in the form of numbers and percentages.

Results

In the current study among 205 dentists, 79.8% of the participants responded that breastfeeding should be initiated within 1 hour of birth whereas only 3.8% reported it to be initiated within 24 hours of birth. Thus, most of the participants had a knowledge about early initiation of breastfeeding [Table 1]. According to the current study, around 78.8% of the participants had the knowledge about commencement of exclusive breastfeeding for 6 months after birth. [Table 1]. The introduction of complementary (solid) foods at around six months is important because early or late introduction can cause health difficulties for the infant. In this study, around 68.8% of the participants were well aware that the solid foods can be introduced when the infant turns 6 months old [Table 2]. We found that 51.0% participants responded that pumped breastmilk can be stored for 4 hours at room temperature. Whereas, only 38.5% of the participants knew that pumped or expressed breastmilk can be stored for 4 days in a refrigerator [Table 2]. Our study found that 71.2% of the participants responded that prolonged bottle feeding is associated with Posterior-cross bite, Anterior open bite, Increased overjet, Dental caries. We also discovered around 76.4% of the participants were aware that non-nutritive sucking habits are associated with infant feeding habits [Table 3, 4].

Discussion

Studies show that newborns who were put to breast within one hour of birth had 29% less chance of dying within the first 28 days of their lives than those who were breastfed 2–23 hours of birth.9 Commencement of breastfeeding within one hour of birth can also avert up to 22% of all newborn deaths. In the present study, 79.8% of the participants responded that breastfeeding should be initiated within 1 hour of birth whereas only 3.8% reported it to be initiated within 24 hours of birth. Thus, most of the participants had a knowledge about early initiation of breastfeeding. According to the current study, around 78.8% of the participants had the knowledge about commencement of exclusive breastfeeding for 6 months after birth. Although globally, only 40% of infants were exclusively breastfed according to a study done by Jama et al 2020 which is expected to rise to 50% by 2025.10 Despite the WHO recommendations and benefits of Exclusive Breast Feeding, worldwide, only 39% of newborns were put to the breast within 1 h of birth, and only 37% of infants were exclusively breastfed.3 The introduction of complementary (solid) foods at around six months is important because early or late introduction can cause health difficulties for the infant. In this study, around 68.8% of the participants were well aware that the solid foods can be introduced when the infant turns 6 months old. According to WHO, Breast-milk is also an important source of energy and nutrients in children aged 6–23 months as it can provide half or more of a child's energy needs between the ages of 6 and 12 months, and one third of energy needs between 12 and 24 months.11 This was evident in our study where 51.4% participants knew that breastmilk can provide one third of energy between 12 and 24 months. Apart from various proteins, fats and minerals, human milk also contains more amount of lactose than cow or goat milk and around 77.4% participants were aware that this is true. We found that 51.0% participants responded that pumped breastmilk can be stored for 4 hours at room temperature. Whereas, only 38.5% of the

participants knew that pumped or expressed breastmilk can be stored for 4 days in a refrigerator. Current study shows that 90.4% of the participants knew that socioeconomic factors play a role in relation to feeding practices. Prolonged breastfeeding increases the risk of having dental caries. According to a study done by Hartwig AD et al in 2019, Children who were breastfed for a period ≥24 months were more likely to have dental caries, when compared with children who were not breastfed or were breastfed for less than 6 months.12 Breastfeeding between 13 and 23 months had no effect on dental caries. Around 69.2% of the participants were well versed about the ill-effects of prolonged duration of breastfeeding on the oral health of a child.13

Also, a recent study done by Chen, X et al 2015 suggests that even in the absence of non-nutritive sucking habits, failure to breast-feed for a sufficient length of time may negatively affect maxillary arch growth and may lead to malocclusion in the form of a posterior crossbite. Another negative consequence may be a prolonged pacifier-sucking habit, found that the probability of this increased 4-fold in children who were breast-fed for less than 6 months. In addition, increased bottle-feeding duration may contribute to inadequate mandibular development, and those non-nutritive sucking habits can be a dominant and deleterious factor in the development of occluso-facial problems.14

Our study found that 71.2% of the participants responded that prolonged bottle feeding is associated with Posterior-cross bite, Anterior open bite, Increased overjet, Dental caries. Hallett et al in 2003 reported that prevalence and severity of Early Childhood Caries decreased with an increased duration of breastfeeding up to 12 months of age compared with not breastfeeding at all.15 Also, Thomson et al in 1996 reported that human milk had a lower pH than bovine milk and bovine milk with a 2% lactose supplement, and that human milk caused greater softening of enamel than bovine milk in intra-oral tests. Therefore, nocturnal breastfeeding after the age of 12 months may pose a risk of ECC.16 A study by Nakayama et al in 2015 suggested that nocturnal breastfeeding and snacking habits are correlated with ECC.17 In the current study,82.2% participants had the knowledge that nocturnal breastfeeding is associated with increased prevalence of dental caries. Dogaru et al. in 2014 reviewed 117 studies and found that “more versus less breastfeeding” was associated with a 22% reduced risk of asthma with the strongest effects being observed before two years of age, when asthma diagnosis is challenging to confirm. Surprisingly around 51.9% of the participants knew that lower risk of asthma was associated with more breastfeeding as against less.18 The results of random effects meta-analyses of eighteen included studies indicated varying degrees of protection across levels of breastfeeding exposure with the greatest protection conferred by exclusive breastfeeding among infants 0-5 months of age and by any breastfeeding among infants and young children 6-23 months of age. Specifically, not breastfeeding resulted in an excess risk of diarrhea mortality in comparison to exclusive breastfeeding among infants 0-5 months of age and to any breastfeeding among children aged 6-23 months.19 This was evident in the present study where 84.6% of the participants had the knowledge about the risk of mortality due to diarrhoea and other infections that can increase in infants who are either partially breastfed or not breastfed at all. According to CDC, HIV is a virus that attacks the body’s immune system and is spread through certain body fluids, including breast milk.

Mother-to-child transmission can occur during pregnancy, birth, or breastfeeding. This was shown in the present study where 64.4% of the participants knew that HIV can pass through breastmilk. Another recent study by Sum et al 2015 showed that pure breastfeeding is associated with reduced chances of developing abnormal primary dentition, such as lower chances of having a Class II incisal relationship and increased overjet. They also found that children with pure breastfeeding for more than 6 months have wider inter-canine and inter-molar widths.20 Ling et al in 2018 also reported that pure breastfeeding for more than 6 months is inversely associated with daily pacifier use and daily pacifier use is positively associated with daily thumb/digit sucking.21 Another study by Montaldo L et al in 2011, reported that Children with bottle or complementary feeding showed a higher risk of acquiring non-nutritive sucking habits after the first year of life. Also, non-nutritive sucking habits are associated with a greater risk of cross bite, open bite, Class II molar relationship.22 We also discovered around 76.4% of the participants were aware that non-nutritive sucking habits are associated with infant feeding habits. Similar results were seen in a study by Shah S et al in 2005, where rapid assessment of breastfeeding knowledge amongst health workers was studied.23 As health professionals, dentists have a critical role in uplifting breastfeeding as a healthy behavior.

Conclusions

Dentists should support exclusive breastfeeding for the first six months and complimentary feeding with continuation of breastfeeding for 12–24 months. They should also institute a positive bond with patients' midwives and guide on the importance of breastfeeding for infants' general and oral health; Mothers should also be educated on general and oral health-related benefits as well as risks of breastfeeding; Dentists should also guide mothers on reducing the frequency and amount of sugar intake of their children; Oral hygiene and fluoride advice to mothers, such as tooth brushing with an appropriate fluoride toothpaste according to the age of the child must be encouraged.

Clinical significance

The current study found that the knowledge regarding benefits and risks of infant feeding practices was moderate among the dentists, but only a small percentage of dentists actually used them in practice. And majority of them were also not aware of current recommendations. Therefore, healthcare professionals like dentists must be prepared and trained about different infant feeding practices especially breastfeeding and introduction of supplementary foods, growth and development of the child, especially in the first two years of life, both in individual appointments and home visits and should be encouraged to practice the same. In addition, they must guide the women and their families with regard to the access to other services and support groups related to breastfeeding and supplementary feeding.

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Tables and figures legends

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Figure 2: Knowledge of dentists regarding association of more breastfeeding with risk of asthma.
Figure 3: Knowledge of dentists regarding carcinogenic constituents in infant formula except?
Figure 4: Awareness amongst dentists regarding when to introduce solid food to an infant.

Table 1: Knowledge of dentists regarding breast feeding

1	World breastfeeding week	1st week of August	1st week of July	1st week of September	4th week of September
		149 (71.6%)	24 (11.5%)	26 (12.5%)	26 (4.3%)
2	Breastfeeding should be	1 hour	2 hours	12 hours	24 hours

	initiated within what period of birth	166 (79.8%)	16 (7.7)	18 (8.7)	8 (3.8)
3	Infants should be fed breast milk exclusively for the first months after birth.	3 months	6 months	12 months	2 years
		9 (4.3%)	164 (78.8%)	28 (13.5%)	7 (3.4%)

Table 2: Knowledge of dentists regarding breast milk

Sr.no.	Knowledge of dentists regarding:	False	True		
1)	Human milk contains more amount of lactose than cow or goat milk	47 (22.6%)	161 (77.4%)		
2)	Infant formula is better than human donor milk for general growth of the child	125 (60.1%)	83 (39.9%)		
3)	For how long can pumped breast milk be stored at room temperature?	1 hour	2 hours	4 hours	6 hours
		36 (17.3%)	45 (21.6)	106 (51.0)	21 (10.1)
4)	For how long can pumped or expressed breastmilk be stored in a refrigerator?	12 hours	24 hours	2 days	4 days
		51 (24.5%)	54 (26%)	23 (11.1%)	80 (38.5%)
5)	Breastmilk can provide of energy needs between 12 and 24 months.	complete	none	one half of energy needs	one third of energy
		21 (10.1%)	8 (3.8%)	72 (34.6%)	107 (51.4%)

Table 3: Knowledge of dentists regarding effects of breast feeding and bottle feeding on oral health

Sr.no.	Knowledge of dentists regarding:	False	True
1)	Prolonged duration of breastfeeding affects oral health of a child	64 (30.8%)	144 (69.2%)
2)	Nocturnal breastfeeding is associated with increased prevalence of dental caries	37 (17.8%)	171 (82.2%)
3)	The risk of mortality due to diarrhoea and other infections can increase in infants who are either partially breastfed or not breastfed at all	32 (15.4%)	176 (84.6%)
4)	HIV can pass through breastmilk	74 (35.6%)	134 (64.4%)
5)	The risk of mortality due to diarrhoea and other infections can increase in infants who are either partially breastfed or not breastfed at all	29 (23.6%)	159 (76.4%)
6)	Non-nutritive sucking habits are associated with infant feeding habits	29	159

Table 4- Awareness amongst dentists

Sr. No.	Awareness amongst dentists regarding:	False	True
1)	Nutrition and dietary habits during infancy and into early childhood play a role in shaping eating habits and health later in adolescence and into adulthood	10 (4.8%)	198 (95.2%)
2)	Socioeconomic factors play a role in relation to feeding practices.	20 (9.6%)	188 (90.4%)
3)	According to the American Academy of Pediatrics and American Academy of Pediatric dentistry, weaning should be carried out using cups and sippers rather than bottles.	26 (12.5%)	182 (87.5%)

Figure 1: Knowledge of dentists regarding effects of prolonged bottle feeding on oral health

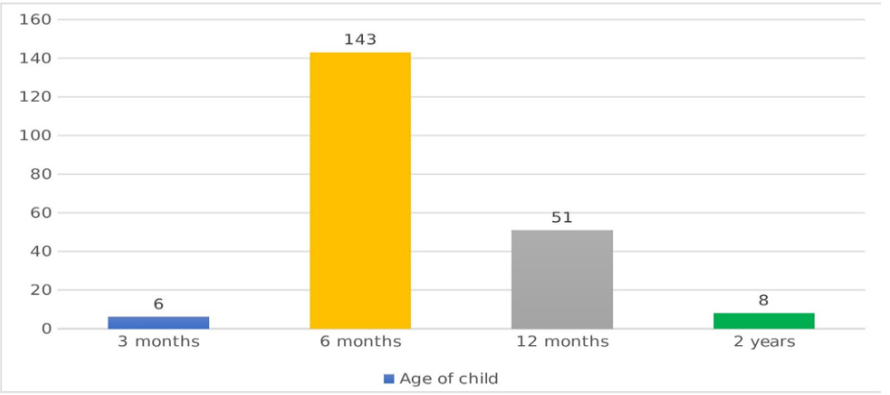

Figure 2: Knowledge of dentists regarding association of more breastfeeding with risk of asthma

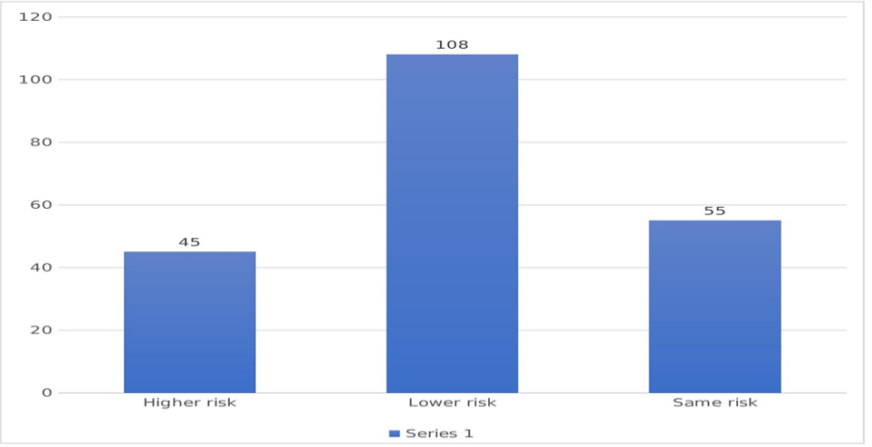

Figure 3: Knowledge of dentists regarding carcinogenic constituents in infant formula

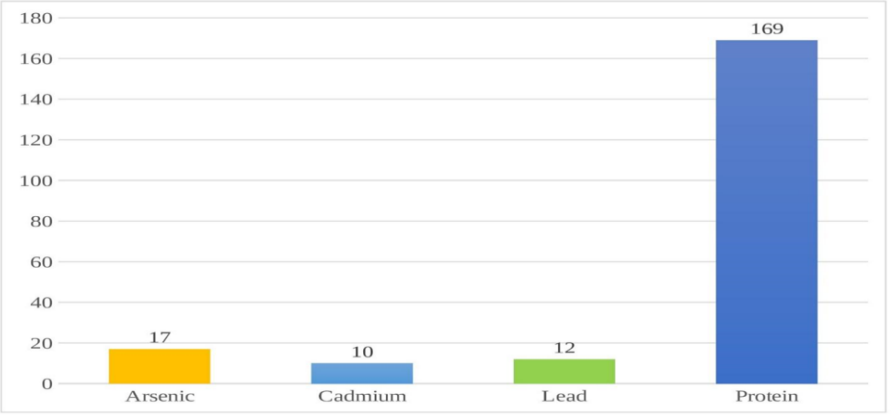

Figure 4: Awareness amongst dentists regarding when to introduce solid food to an infant