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Infant oral health care: Knowledge, attitude and practice among mothers of infants in Kottayam district: A cross sectional study

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Abstract

Introduction: Infant oral health acts like a foundation over which a dentist can emphasize the importance of various preventive measures to the parents. Mothers being the primary care giver, play an important role in infant oral health care. It is important for the mothers to have adequate awareness and knowledge about proper feeding practices as well as oral hygiene habits.

Aim: To assess the knowledge, attitude, and practice regarding Infant oral health care among mothers of infants in Kottayam district.

Materials and Methods: Cross sectional study conducted among 150 mothers of infants enrolled in the Anganwadi centers of Kottayam district. A pre-validated, self-administered structured questionnaire in local language (Malayalam) was used to collect the data. For statistical analysis, the chi square test was employed.

Results: The overall level of knowledge and practice among the mothers were relatively on the lower range while they had a positive attitude towards infant oral healthcare based on Knowledge, Attitude and Practice (KAP) score with ($P>0.05$).

Conclusion: The frontline health care professional's and dentists should educate the new and the expectant mothers regarding the appropriate care of infant oral health.

Keywords: Infant oral health, early childhood caries, preventive care

Introduction

Oral health care should start from the early infancy for molding the young smiles into perfection. Infant oral health acts like a foundation over which a dentist can emphasize the importance of various preventive measures to the parents and at the same time can prevent the incidence of many oral diseases. However, a proper infant oral health is often neglected by majority of the parents. This is due to the lack of proper knowledge about the detrimental consequences that can arise in the absence of a routine oral hygiene practice and proper dietary regimen favoring a healthy oral environment. When it comes to making decisions regarding their children's dental health, parents play a crucial role. Therefore, parents, along with clinicians, play a key role in attempts to achieve the best oral health outcomes for their children^[1].

The American Academy of Pediatric Dentistry has defined ECC as "the presence of one or more decayed (non-cavitated or cavitated lesions), missing (due to caries), or filled tooth surfaces in any primary tooth in a child under the age of six^[2]. Early childhood caries (ECC) is an infectious and preventable disease that is transmitted vertically from mothers or other intimate caregivers to infants^[3]. With approximately 514 million affected children globally, ECC ranks among the most common childhood diseases^[4, 5]. The overall prevalence of ECC in India has been reported as 49.6%^[6]. Additional health issues linked to ECC include localized discomfort, infections, abscesses that cause difficulties chewing, malnourishment, gastrointestinal issues, and trouble sleeping^[7]. Mothers being the primary care giver and protector of the child, play an important role in infant oral health care.

Child's oral health is likely to be directly influenced by the mother and maternal factors may play an important role in the development of ECC [8]. Child-rearing factors which may predispose to ECC include late introduction of toothbrushing habits, certain breast- and bottle-feeding practices, prechewing of food for infants (mothers chew food before putting it in their child's mouth), and high sugar intake in young children [9]. Thus, it becomes important for the mothers to have adequate awareness and knowledge about proper feeding practice as well as oral hygiene habits which will be imbibed by the infants. This will ultimately be beneficial in reducing the burden of dental caries in children [10].

Constantly in pediatric dental practice, parents are often unaware of the role and significance of primary teeth. A child's primary teeth are their most precious possessions. In children, milk teeth/primary teeth play a vital role for eating, phonetics, esthetics and as a space maintainer till the permanent teeth erupt [11]. Loss of primary teeth due to caries can lead to a psychological disturbance apart from inability to masticate properly, thus compromising the child's quality of life. It is convenient to combine the initial pediatric checkup with a dental checkup which would assure early, regular inspection of the infant's oral cavity as well as a consequent and professional information for the mother [12].

Considering the mother's key role in the well-being of the child, it is important to assess their Knowledge, Attitude and Practice about the infant oral health care which will in turn significantly impact the oral health status of the child. This also ensures that the child gets proper attention right from the infancy period.

Studies eliciting parental knowledge, attitudes, and preventive behaviors on oral health of children are scanty [13-15]. Thus, this cross-sectional study was aimed to assess the knowledge, attitude, and practice regarding Infant oral health care among mothers of infants in Kottayam district.

Materials and Methods

Study location

This cross-sectional study was performed for a 6-month period from October, 2023 to March, 2024 at Anganwadi centers in Kottayam district.

Ethical consideration

The study was approved by the Institutional Ethical Committee and review board of Government Dental College, Kottayam {IEC/M26/2023/R488/DCK}.

Inclusion and exclusion criteria

To be eligible for the study, the participants should be mothers of infants who were able to read, write and willing to participate in the study. Participants who were not native were excluded.

Sample size

The sample size was calculated based on the observations from previous literature [16]. The sample size was estimated to be around 170.

Methodology

Study population were selected based on convenience sampling. Mothers of infants, who were enrolled in the Anganwadi centers in the Kottayam district were contacted through Anganwadi workers. The objectives and nature of the study was explained to the participants, while the voluntary nature of participation was emphasized and strict

confidentiality assured. Those who fulfilled the inclusion criteria were part of the study. A written informed consent form according to the ethical guidelines was subsequently obtained from the participating mothers.

A pre-validated, self-administered structured questionnaire in local language (Malayalam) was used to collect the data. The questionnaire essentially comprised of two parts: First part contains the general demographic data and the second part includes closed ended questions which assess the knowledge, attitude, and practice. Each question was provided with options with correct and incorrect answers. Participants were asked to check the option that they felt as the best response.

Statistical analysis

Collected data were entered in MS Excel and statistical analysis was done using the Software, Statistical Package for Social Sciences (SPSS, VERSION 16.0). Descriptive statistics was done to analyze the responses. For the assessment of the relationship between the KAP score and demographic parameters, Chi Square test was used. The level of significance was set as $p \leq 0.05$.

Results

The total study population consisted of 170 mothers belonging to different levels of education. Majority of the study population had higher literacy levels. 42.6% of the study population resided in town and 57.4% belonged to rural areas.

The responses of the mothers towards Knowledge, Attitude and Practice regarding infant oral healthcare is summarized in the table 1. Questions 1 to 5 assessed the practice; 6 to 13 assessed the knowledge and the last two questions evaluated the attitude of mothers towards infant oral health care. The order of the sections in the questionnaire were specifically constructed in such a way that the questions assessing the practice were kept initially followed by those assessing knowledge and attitude. This was done to avoid any biases that could possibly occur.

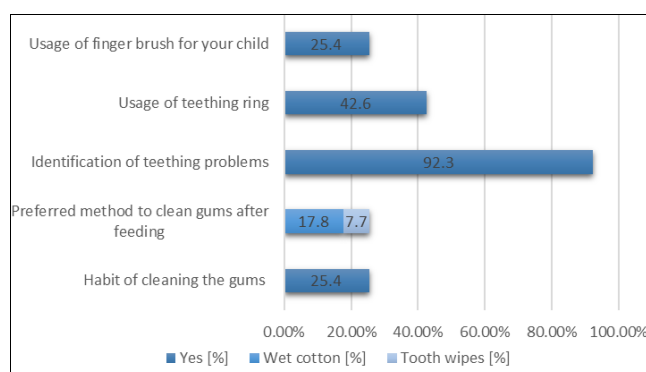


Fig 1: Practice of Infant Oral health care

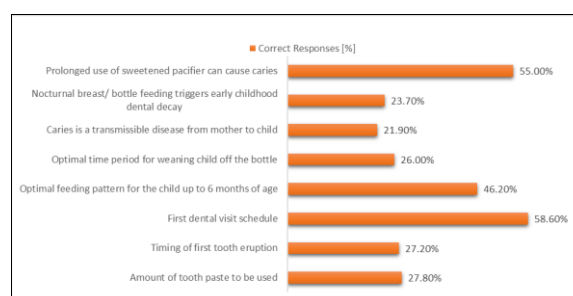


Fig 2: Knowledge of Infant Oral Health Care

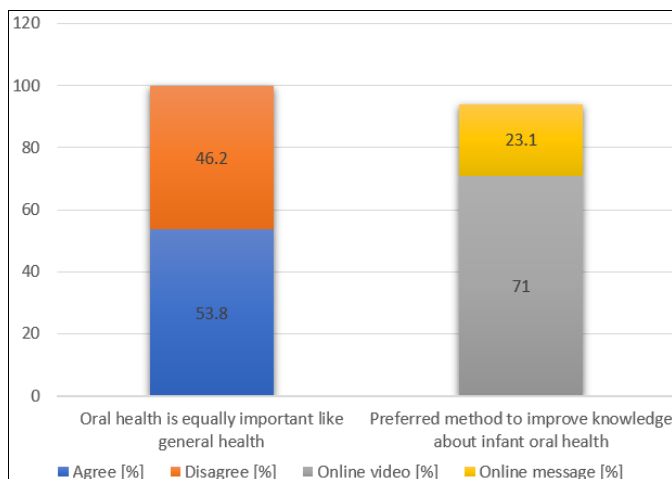


Fig 3: Attitude of parents towards Infant Oral Health

Fig 1, 2 3: Represents the mean % Practice, Knowledge and Attitude respectively.

The overall level of knowledge, attitude and practice in terms of mean (%) among the study participants is highlighted in the figure 4.

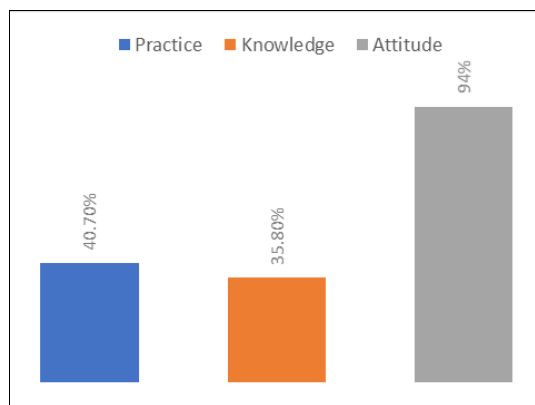


Fig 4: Overall KAP %

The values showed that the level of Knowledge and practice in this study participants are relatively on the lower range (only less than 40% of the participants answered the questions correctly). About 71% preferred online videos and 23.1% preferred online messages to improve their knowledge regarding infant oral health care, therefore more than three-fourth of the participants had a positive attitude to know more information about infant oral care through online mode (94%).

Table 1: Description of responses according to Education level of the mothers

Questions	Response	%				p value
		10th	12th	Graduate	PG	
[Q1] Do you have the habit of cleaning the gums of your child before eruption of tooth?	Yes	0	0	5.1	86.4	0.001
[Q2] Which of the following method do you prefer to clean your baby's gums after feeding?	Wet cotton	0	0	0	68.2	0.001
	Tooth wipes	0	0	5.1	18.2	
[Q3] Have you noticed any teething problems like pain or gum soreness in your child's mouth?	Yes	36.4	60	100	100	0.001
[Q4] Have you ever used a teething ring for your child during teething?	Yes	0	46.7	41.4	54.5	0.012
[Q5] Have you ever used a finger brush for your infant?	Yes	0	0	5.1	86.4	0.001
[Q6] How much amount of tooth paste should be used for Infant?	Smear layer size	27.3	33.3	26.3	29.5	0.001
[Q7] When does the first tooth erupt in your child's mouth?	6 months	0	13.3	12.1	72.7	0.001
[Q8] When does the first dental visit of infant be scheduled?	First tooth erupts	27.3	33.3	47.5	100	0.001
[Q9] Which among the following will be the optimal feeding pattern for the child up to 6 months of age?	8-10 times/day	27.3	13.3	30.3	97.7	0.001
[Q10] Which among the following is the time period for weaning your child off the bottles?	1-2 years	9.1	0	5.1	86.4	0.001
[Q11] Caries is a transmissible disease from mother to child while sharing food/ rearing child?	Agree	0	0	0	84.1	0.001
[Q12] Nocturnal breast/ bottle feeding can trigger early childhood dental decay.	Agree	0	0	6.1	77.3	0.001
[Q13] Prolonged use of sweetened pacifier can cause caries and effect normal development.	Agree	27.3	33.3	48.5	84.1	0.001
[Q14] Oral health is equally important like general health.	Agree	27.3	33.3	45.5	86.4	0.001
[Q15] Which of the following method you prefer to improve your knowledge about infant oral health?	Online message	36.4	0	0	79.5	0.001
	Online videos	27.3	60	100	20.5	

The result shows that there is a significant difference in responses between respondents from various levels of education.

Discussion

Infants are solely dependent on their mothers. The mothers play an important role in imparting the knowledge about oral hygiene practices to their children. According to Suresh B S *et al.*, it has been found that young children's oral health maintenance and outcomes are influenced by their parent's knowledge and beliefs [14]. Negligence of mothers to seek dental care during pregnancy and mother's poor oral health is associated with poor oral health of their off springs [17, 18]. Early childhood caries is still a burden to the society, even though there are various preventive measures and advanced treatment modalities. This happens mainly due to the

negligence towards oral health care of infants right from the initial stages of tooth eruption. An in-depth knowledge about the feeding practices by the mothers are also required to prevent the incidence of early childhood caries.

According to the study conducted by Suchitra M S *et al.* in 2018 in Thiruvananthapuram, Kerala, the prevalence of ECC among 2- to 6-year-old preschool children was found to be 59.3% [19]. The higher rate of occurrence of caries indicates that the parents or care-givers are not sufficiently aware about the importance of primary teeth. In this study, all the questions regarding the knowledge, attitude and practice were significantly and most appropriately answered by the mothers with higher educational levels which is in agreement with the study by Vaishnavi S *et al.* [20]. The Anganwadi health workers should provide oral health care information to the mothers at the time of enrollment and a proper referral to the

dentist should be emphasized. In order to make this possible, the frontline health workers should be trained to give oral health care information along with general health. Training programs by the government organizations should be conducted at the grass root level. The knowledge, attitude and practice scores of mothers belonging to the rural subgroup were significantly low in a study by Motee A *et al.* [21]. Our study shows that there is a significant difference in responses between respondents from rural and urban areas, except for questions regarding teething problems and usage of teething rings. Positive attitude towards oral health care was significantly high among the residents in urban areas. Implementation of awareness programs in the rural areas regarding the utilization of oral health services and preventive regimens can bring about major improvement in oral health care of that population.

In the current scenario, the assessment of knowledge, attitude, and practice of mothers regarding infant oral health care is relevant. In our study, about, one fourth of the mothers had the habit of cleaning their infant's gums after feeding either by wet cotton or tooth wipes. A similar study by Manjot Kaur *et al.*, 17 % of parents cleaned their child's gum pad with their fingers and few parents with a moist cloth. Pasiga *et al.* suggested that finger brush may be an alternative for removing plaque in uncooperative children under five years old [22]. Nearly one fourth of mothers of present study, preferred using a finger brush to clean their infant's mouth. Parents should brush or clean their baby's gums and teeth every day till the child is old enough to manage themselves. They should be educated by the dentist about the importance of cleaning the infant's gums properly before the eruption of the primary teeth. It is well known that syrups and infant substitutes cause dental caries and parents should be advised to clean the gums and teeth of their infants after giving medicated syrup. Vaishnavi *et al.* reported that only few parents clean their child's mouth after giving medicated syrup [20]. In this study, majority of the mothers were not aware about the amount of tooth paste to be ideally used to clean their child's teeth. Wright J T *et al.* suggested that the child's teeth should be brushed twice daily with a smear layer of fluoridated tooth paste [23].

The sequential appearance of the infant's teeth into the oral cavity through gums is known as teething. At the time of teething, the infant often gets irritated and may become fussy due to the symptoms like redness, pain and swelling of the gingiva, an increase in body temperature than normal, drooling of the saliva and desire to chew on hard substances and irregular sleep pattern. In our study only few mothers failed to identify teething problems. Among those who identified teething problems, less than half of mothers used teething rings to comfort their child which is slightly lower when compared to a study by Dorota *et al.*, in which most of the mothers used teething rings to ease the symptoms associated with teething [24]. According to a study by Indira M D *et al.*, majority of the mothers had received information about teething mostly from their mother, very few from the pediatricians and none from the dentist [25]. As stated in the latest AAPD guideline regarding the peri-natal and infant oral health care, prolonged nocturnal bottle feeding, use of sugar-coated pacifiers, frequent improper feeding practices should be avoided to prevent the occurrence of early childhood caries. As per our study, nearly half of the mothers knew about the optimal feeding pattern up to 6 months of age which is about 8-10 times per day. Majority of the mothers were unaware about the time period to wean the child off the bottle

which is in contrary to a study performed by Motee A *et al.*, in which most of the mothers completely terminated breastfeeding around 19–24 months [21]. Nearly half of the mothers believed that usage of sweetened pacifiers could be the prime factors in triggering the occurrence of early childhood caries and at the same time one fourth of the mothers admitted that nocturnal breast/bottle feeding could be the reason for ECC.

American Academy of Pediatric Dentistry Guidelines, recommended the age for the first dental visit which ranges from the time of eruption of the first tooth to 1 year of age. More than half of the mothers who participated in our study had an idea about the correct schedule of the first dental visit and this is significantly higher when compared to the study by Kanika *et al.*, in which majority of the mothers lacked satisfactory knowledge regarding the first dental visit for their children [10]. Most of the mothers in the present study were not aware about the correct timing of eruption of the first primary tooth in the oral cavity. This knowledge paves the way for the first step towards the foundation of infant oral health care. Dental caries can be transmitted from the mother to the infants while sharing the food and feeding utensils and this concept was believed only by one-fourth of the mothers who participated in this study.

Dentists along with nurses, Pediatricians and other healthcare professionals can enhance the knowledge, attitude and practice of mothers regarding infant oral health care right from the antenatal period itself. About half of the study participants in this study wanted to give equal importance to oral health as that of the general health. For boosting the knowledge regarding the infant oral health care, nearly three-fourth of the mothers preferred online videos while the remaining opted online messages for the same. Majority of the study population did not have a satisfactory knowledge and practice regarding the infant oral health care and about three-fourth of them had a positive attitude towards infant oral health care which is in consonance to a study by S Dhull *et al.* [10]. Mishra *et al.* claimed that mothers can have a significant impact on encouraging children to have healthy attitudes and dental hygiene habits [26]. In this internet era, social media has the power to influence common people.

Therefore, steps should be taken to impart the updated knowledge regarding infant oral health care through these platforms. Development of oral health care promotion apps through informative and interactive video sessions will be beneficial to the parents.

Conclusion

The study shows that the more than half of the participants did not have sufficient knowledge, attitude and practice towards infant oral health care. It is generally proven among the study participants that mothers from urban areas and those who had completed higher education have comparatively higher knowledge and better practice. Higher interests were seen among 94% of mothers for acquiring infant oral healthcare education. Thus, the frontline health workers and dentists should educate the new and the expectant mothers regarding the appropriate care of infant oral health so as to reduce the burden of early childhood caries and preserve the young smiles while improving their overall quality of life.

Strength

There are very little number of studies that elicited the maternal knowledge, attitude and practice among the mothers of infants. The present study evaluated the knowledge,

attitude and practice regarding the infant oral health care among the mothers of infants for the first time in Kerala population.

Limitation

The study is limited to the population of Kottayam district. Future studies should be conducted to include wider range of population to get more accurate results.

Recommendations

1. Awareness programs and dental camps should be conducted in the outskirts areas emphasizing the infant oral health care.
2. Training should be given to the frontline health workers regarding oral health care of mothers and infants for providing proper information to the expectant and new mothers.
3. Knowledge regarding Infant oral health care must be included in the vaccination card.
4. Proper referral system should be established right from the antenatal period so that dentist could do their part in molding the young smiles.

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Conflicts of Interest: Nil

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