Research Article

Evaluation of the knowledge, attitude and awareness in prevention of dental caries amongst paediatricians

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ABSTRACT

Background: Early assessment of the oral health status of children has the potential to reduce or even eliminate oral diseases. Paediatricians are considered a perfect and reliable source for oral health control and prevention. In dentistry, clinical practice is directed towards attitudes that promote oral health and the paediatricians occupy a privileged position in this process. The purpose of this study was to evaluate the knowledge, attitude and awareness of paediatricians in the prevention of dental caries in 3 district quarters, India.

Methods: A cross-sectional survey was undertaken among 123 registered paediatricians in Indian Academy of Paediatrics (IAP) Karnataka directory and digest 2011-2013, Karnataka society. Out of which, 42 did not participate as their email address were not available. 29 sets of questions were mailed to all 81 paediatricians.

Results: The response rate of the survey was 90% (70 out of 81), a total of 59% felt that the frequency of Early Childhood Caries (ECC) in their O.P.D was at least once a week. 51% responded that bacteria causing dental caries cannot be transmitted between mother and child. 53% felt that 1 year would be ideal for first dental visit. 64% of pediatricians were not aware that fluoride dentifrices and dental sealants will prevent dental caries.

Conclusions: In general, pediatricians’ knowledge, attitudes and awareness regarding oral health and prevention of dental caries was not satisfactory. It is essential to develop oral health information programs to pediatricians.

Keywords: Pediatrician, Knowledge, Dental caries, Oral health, Early childhood caries, First dental visit

INTRODUCTION

Dental caries is an important public health problem and it is the most prevalent oral disease among children. This disease not only causes damage to the tooth, but is also responsible for several morbid conditions of the oral cavity and other systems of the body. The prevention of oral disease and maintenance of oral health are the major challenges of dentistry.

Early Childhood Caries (ECC) is a particularly virulent form of dental caries affecting the primary teeth of infants and toddlers. Prolonged bottle-feeding with sugar containing fluids, especially before sleep, and delayed weaning are frequently cited ECC risk factors. Epidemiological studies have also documented low socioeconomic status, minority status, low birth weight and transfer of microbes from mother to child through the sharing of spoons and soothers as ECC risk factors. The specialized treatment of a paediatric dentist is inimitable. The contributors of the oral health professionals from the fields of dentistry, medicine and related professions are extremely important to raising awareness regarding oral health and prevention. A large number of health professionals are involved with child health care. At public or private health care services, Paediatrician is the first to maintain contact with the child.
since birth and has responsibility to inform parents regarding habits, attitude, and actions of a child for a healthy life. Thus, the paediatrician is in the ideal position to orient parents regarding the prevention of oral diseases in children.\textsuperscript{14-18} They are also well positioned to begin this process with an early assessment of oral health and the provision of anticipatory guidance, ensuring that patients establish a dental home in addition to their medical home.\textsuperscript{19}

Dental caries can be prevented if the pediatrician recognizes and encourages good preventive habits and refers appropriately. The role of Paediatricians in oral health was formalised in a policy issued by the American Academy of Paediatrics in 2003 and reinforced by another policy issued in 2008.\textsuperscript{20}

Very few studies have been conducted on dental screening and referrals by pediatrician’s or the effectiveness of their dental caries preventive activities. The absence of exact statistics on the paediatrician awareness concerning children’s caries prevention in India led us to conduct this study. Therefore the purpose of this study was to determine the knowledge, attitude and awareness in prevention of dental caries amongst pediatricians in Davangere, Chitradurga and Shimoga districts in Karnataka.

**METHODS**

A cross-sectional survey was undertaken among the pediatricians in Davangere, Chitradurga and Shimoga districts in Karnataka. The list of pediatricians was obtained from the Karnataka IAP member list till 2012. There were 123 registered pediatricians in this society from the respective three districts. Out of which, 42 did not participate as their email address was not available. Through Google form software, request letters along with a set of 29 questions with their options was prepared, and were mailed to all 81 pediatricians. Out of which, 70 of them responded and 11 did not respond. Paediatricians who did not respond to the initial mailing were sent a reminder mail after 1 week, in an attempt to maximize the response rate; telephone calls to encourage participation were made to all paediatricians after initial mailing.

The questionnaire had questions to assess their personal details, knowledge about dental caries, attitude and awareness toward its prevention and practice guidelines and opinions. The queries about their personal details included questions regarding their gender, type of practice, qualification and age, in which city they are practicing, number of years in practice, number of patients seen per day, type of practice and the frequency of Early Childhood Caries (ECC) in their OPD.

The knowledge was assessed based on questions about Early Childhood Caries (ECC), factors causing caries, whether the amount or frequency of sugar intake causes caries, night feeding practices, breast feeding or bottle feeding causes caries and mode of spread of caries. Their attitude towards prevention of dental caries depending on the response to queries on first dental visit, frequency of dental visits, examination of the child’s teeth for cavities, importance of tooth brushing and when to begin tooth brushing, recommendation to parents to clean their children’s teeth twice daily. Their awareness towards prevention of dental caries with the use of dentifrices and sealants, by routine dental visits, recommendation of pacifier use, do they think paediatrician have a role in preventing oral diseases and do they refer children with oral disease to pedodontists.

Scores were given to each question with respect to knowledge, attitude and awareness section. The maximum score was given to the correct answer and minimum was given to the incorrect answer.

Scoring criteria: The scores were assessed as follows.

- <50%: Poor
- 50-75%: Moderate
- 75%: Good

**RESULTS**

A total of 29 questionnaires were mailed to 81 paediatricians, out of which 70 participated and replied back with a duly completed form. The results were tabulated in four sections.

Personal details of respondents were obtained. The sample included pediatricians of both genders 80% males and 20% females, ranging in age from 30 to 70 years (mean age: 35 years). Out of which majority 62% were institutional based practitioners, 9% institutional based non practitioner and 29% private practitioner residing in 3 districts; Shimoga 43%, Davangere 40% and Chitradurga 17%. The majority (64%) pediatricians were MBBS, MD by their qualification, with 61% having 5-20 years of practice, among which 40% of them were seeing 25-50 patients per day with 34% in teaching practice and 31% in solo practice. Most of the paediatricians 59% felt that the frequency of Early Childhood Caries (ECC) in their O.P.D was at least once a week (Table 1).

44% of the pediatrician felt that bacteria is the factor involved in the process of caries followed by the importance of frequent sugar intake in relation to caries etiology (43%), whereas 46% did not respond to night feeding may lead to caries. The majority 73% of pediatrician responded that exclusive breast feeding for more than 14 months cannot cause ECC. But 40% said that Bottle feeding can cause dental Caries, and 51% of them felt that the bacteria causing dental caries cannot be transmitted between mother and child. More than half 54% respondents thought that inadequate tooth brushing and poor oral hygiene can lead to ECC, and 49% thought that family tendency can lead to ECC. Also 23% of them
thought that malposition or crowded teeth cannot lead to ECC (Table 2).

Table 1: Personal details of respondents.

| Personal details                        | %   |
|----------------------------------------|-----|
| Your gender                            |     |
| Male                                   | 80% |
| Female                                 | 20% |
| Type of practitioner?                  |     |
| Institutional based practitioner       | 62% |
| Institutional based non practitioner   | 9%  |
| Private practitioner                   | 29% |
| Your qualification                     |     |
| MBBS, Dch                              | 29% |
| MBBS, MD                               | 64% |
| MBBS, Dch, MD                          | 7%  |
| Your age                               |     |
| 30-40                                  | 36% |
| 41-50                                  | 29% |
| 51-60                                  | 22% |
| >60                                    | 13% |
| In which city is your principle practice setting located? |     |
| Chitradurga                            | 17% |
| Davangere                              | 40% |
| Shimoga                                | 43% |
| Years in practice                      |     |
| < 5 years                              | 16% |
| 5 to 10 years                          | 30% |
| 10-20 years                            | 31% |
| > 25 years                             | 23% |
| No. of patients seen per day?          |     |
| <10                                    | 6%  |
| 10-25                                  | 31% |
| 25-50                                  | 40% |
| >50                                    | 23% |
| Type of practice?                      |     |
| Solo                                   | 33% |
| Group                                  | 11% |
| Teaching                               | 34% |
| General hospital                       | 21% |
| What is the frequency of early childhood caries (ECC) in your OPD? |     |
| >once a week                           | 24% |
| At least once a week                    | 59% |
| Never in a week                        | 10% |
| Other                                  | 7%  |

Table 2: Knowledge about early childhood caries (ECC).

| Knowledge about ECC | %   |
|---------------------|-----|
| What factors are involved in the process of caries? |     |
| Fluoride            | 10% |
| Tooth               | 6%  |
| Time                | 13% |
| Bacteria            | 44% |
| Carbohydrates       | 27% |
| Saliva              | 0%  |
| Which is more important in causing dental caries? |     |
| Amount of sugar intake | 40% |
| Frequency of sugar intake | 43% |
| I don’t know         | 17% |
| Do you think that night feeding may lead to caries? |     |
| Yes                 | 11% |
| No                  | 43% |
| No response         | 46% |
| Do you think exclusive breast feeding more than 14 months can cause ECC? |     |
| Yes                 | 6%  |
| No                  | 73% |
| Not aware            | 21% |
| Do you think bottle feeding can cause dental caries? |     |
| Yes                 | 40% |
| No                  | 31% |
| Not aware            | 28% |
| Do you think dental caries causing bacteria can be transmitted between mother and child? |     |
| Yes                 | 29% |
| No                  | 51% |
| Not aware            | 20% |
| Do you think inadequate tooth brushing and poor oral hygiene can lead to ECC |     |
| Yes                 | 54% |
| No                  | 17% |
| Not aware            | 29% |
| Do you think family tendency can lead to ECC? |     |
| Yes                 | 13% |
| No                  | 49% |
| Not aware            | 39% |

Attitude of pediatricians towards prevention of dental caries was obtained, and about half i.e. 53% of pediatricians felt that 1st year would be ideal for the first dental visit and the frequency of dental visit for a child should be once in a year with, 59% pediatricians examine teeth for cavities in children and 44% counsel children and their parents on the importance of tooth brushing, while 64% suggest commencement of tooth brushing should be initiated after eruption of some milk teeth (Table 3).
Table 3: Attitude of pediatricians towards prevention of dental caries.

| Attitude of pediatricians | % |
|---------------------------|---|
| When should be the first dental visit for a child? | |
| 6 months                  | 21% |
| 1 year                    | 53% |
| Dental caries present     | 19% |
| Pain present              | 7%  |
| What should be the frequency of dental visit for a child, once in? | |
| 6 months                  | 27% |
| 1 year                    | 53% |
| Dental caries present     | 17% |
| Pain present              | 3%  |
| Do you examine teeth for cavities in children? | |
| Yes                       | 59% |
| No                        | 17% |
| No response               | 24% |
| Do you counsel children and their parents on the importance of tooth brushing? | |
| Yes                       | 44% |
| No                        | 24% |
| No response               | 31% |
| When do you suggest commencement of tooth brushing should be initiated? | |
| After eruption of first milk teeth | 13% |
| After eruption of some milk teeth | 64% |
| After eruption of all milk teeth | 23% |

Awareness towards prevention of dental caries and their practice guidelines were tabulated in Table 4 were more than half 64% of pediatricians were not aware that fluoride dentifrices and dental sealants will prevent dental caries, but 60% recommended the parents to wash/clean their children’s teeth twice a day, and 86% refer children with oral disease/dental caries to pedodontist.

Most of the pediatricians (87%) recommended that routine dental visit is important in preventing dental caries and 51% do not recommend or restrict the use of a pacifier, whereas as 91% Pediatrician thinks that they have a role in promoting oral health in prevention of oral disease.

DISCUSSION

The US surgeon general’s report on oral health, entitled “Oral health in America,” highlighted the fact that “Dental caries is the single most common chronic childhood disease and is 5 times more common than asthma and 7 times more common than hay fever.”21,22 The third national health and nutrition examination survey (1988-1994) showed that 1 in 5 children between the ages of 2 and 5 years had decayed teeth. More ominously, 71% of the decayed primary teeth had not been restored in this 2- to 5-year-old children.21,23

The present study focuses on the crucial oral preventive role of paediatricians who are considered the primary link between dentists and children. Therefore, this survey was planned to evaluate the knowledge, attitude and awareness of paediatricians in Chitradurga, Davangere and Shimoga districts in Karnataka, in order to ensure that maximum preventive and interceptive benefits can be delivered to children in the domain of oral health.

Appropriate breastfeeding is recognized as the best feeding method for infants. However, nocturnal breastfeeding, at will-breast feeding, and weaning delayed beyond the age of 2 years could all have a harmful effect on dentition similar to that produced by bottle feeding.24-26 A study done by Sabbagh et al. 2011, the majority of paediatricians (81.3%) were familiar with the harmful effects of night breast feeding.24,27 In a previous study by Murthy et al. 2010, more than 50% of them felt that only bottle fed children gets ECC. But there is evidence to show that infants who sleep with the mother and nurse all night long have an increased risk of caries.4,28,29 Less than half the pediatricians knew that cavity causing bacteria can be transmitted from the mother12,29 to children, which is also cited in the pediatric literature.30 However in the present study, the majority (73%) of pediatricians responded that exclusive breast feeding for more than 14 months cannot cause ECC. But 40% paediatricians said that bottle feeding can cause dental caries, whereas 51% of them do not agree with the transmission of caries from mother to child.
Gabriella et al. in 2006 did a study and concluded that more than half (56%) of the respondents knew all the main risk factors of dental caries i.e. inadequate cleaning of the teeth, gingivitis and malposition teeth. Similarly, in the present study, more than half (54%) respondents thought that inadequate tooth brushing and poor oral hygiene can lead to ECC, and 49% thought that family tendency can lead to ECC whereas 23% thought that malposition or crowded teeth cannot lead to ECC.31

In the present study, 53% of the paediatricians felt that 1 year would be ideal for the first dental visit. This is in accordance with the AAPD (American Academy of Paediatric Dentistry) guidelines and AAP (American Academy of Pediatrics) which say that the first dental visit should be within 6 months of the eruption of the first tooth per year.27,28 This is supported by similar studies.13,14,16,17,21 Early visits to the dentist allow preventive measures, early diagnosis, and orientations regarding proper diet and oral hygiene as well as the prevention of non-nutritive sucking habit.17,32,33 Half of the paediatricians were not aware of the biannual dental visit that is recommended by AAPD.34

A previous study by Lewis et al.17 reported that many respondents were unaware of the first signs of tooth decay, and Sanchez et al.35 reported that 83% of physicians performed oral examinations during children’s physical examinations. Although in the present study, 59% of pediatricians reported to examine teeth for cavities in children and 44% counsel children and their parents on the importance of tooth brushing, while 64% suggested commencement of tooth brushing should be initiated after eruption of some milk teeth.

Therefore, having knowledge on diagnosis of caries, as reported by Prakash et al.14 and Murthy et al.36 in which more than 60% of the paediatricians felt that tooth brushing should begin after few teeth have erupted though AAPD guidelines say that brushing should begin with the eruption of the first tooth.

Raquel et al.1 reported the paediatricians’ demonstrated satisfactory knowledge on orientations regarding oral hygiene, although they made this recommendation at a lower percentage than the 100% reported by Brickhouse et al.17 There seem to be questions regarding the use of fluoride; however, fluoride is mainly used in fluoridated water, fluoridated dentifrices, and the topical application by an oral health professional. The decision to use fluoride therapy must consider the risk of caries versus the risk of fluorosis. Patients identified as at greater risk of caries are candidates for more aggressive fluoride therapy.36 It is evident that the use of fluoridated dentifrices requires a certain degree of care. Sabbagh et al.24 concluded that only 11.3% of paediatricians prescribing fluoride which was similar to the present study in which 24% paediatricians recommend fluoride dentifrices to prevent caries and 60% recommended the parents to wash/clean their children’s teeth twice a day.

Lewis et al.16 reported that only 60.8% of paediatricians were aware of the fact that 3 months of age infants do not need fluoride supplementation. However, in the present study, the pediatrician's knowledge of caries prevention and potentials of fissure sealants were found to be limited, considering that 64% of pediatricians did not even know what fissure sealants are. Similar results were also reported by previous studies.27,35,37

In a study by Murthy et al.29 majority of (>90%) paediatricians felt that assessment of dental caries and counseling about prevention of it should be a part of well child care. Almost all of them agreed to have a role in promoting oral health, this result is similar to that reported by Sanchez et al.35 which was similar to the present study in which 91% Pediatricians think that they have a role in promoting oral health in prevention of oral disease. Sabbagh et al.24 reported that 78% of pediatricians routinely examined the oral cavity. This reflects an awareness of their role in promoting oral health care. However, Al-Hussyeen et al.27 reported that almost half of pediatricians did not routinely include dentition in their examinations.

Sabbagh et al.24 concluded that only 47.7% of pediatricians instructed their patients to visit the dentist, however, they did not check out parents compliance or appointment availability. They either referred them to general dentists (39.7%), or to the pediatric dentists (23.4%). However in the present study, 86% pediatricians refer children with oral disease/dental caries to pedodontist.

CONCLUSION

Our study indicates that most of the pediatricians in Chitradurga, Davangere and Shimoga district had a good attitude towards oral health care, but had moderate knowledge and lacked proper awareness about dental caries.

This survey indicates that pediatricians overwhelmingly believe that they have an important role in the promotion of oral health. Lack of familiarity with oral health issues may make it difficult for them to promote prevention of dental caries. Given the frequency with which pediatricians encounter dental caries, additional oral health related training in pediatric residency could be considered. With their attitude towards prevention of dental caries, even setting up of dental home along with medical home by 1 year of age for all children could be initiated in our public health centres.

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