Knowledge and attitude among dental practitioners regarding the use of fluoride toothpaste for children

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Abstract
Aim: To evaluate the knowledge and attitude among dental practitioners in Kerala regarding the use of fluoride toothpastes for children.
Materials and Methods: A cross sectional descriptive, questionnaire based online survey was conducted among 300 dental practitioners in Kerala. A Self-administered, structured online questionnaire was send to them for the assessment of their knowledge and attitude regarding the use of fluoride toothpastes in children and the data was analyzed using SPSS 18 software.
Results: Among the study subjects, 40 % of the respondents considered that it is very important to brush child's teeth with fluoride toothpaste. Whereas 66 % of them knew that 1000 ppm fluoride should be present in toothpaste for getting its benefit.70 % of the respondents recommended Kid's fluoride toothpastefor childrenand about 20.3 % of them think kid's toothpaste contains 1000 ppm fluoride. Only 18% of them recommended regular fluoride toothpaste for children. 60.7 % of the respondents knew about the symptoms seen when high amounts of fluoridated toothpaste were ingested. 52.3 % knew how to manage a child who had ingested high amounts of fluoride toothpaste and 64.7 % knew how to reduce the intake of toothpaste by children. 66 % of the respondents suggested twice daily brushing with fluoride toothpaste and 55 % of them suggested pea sized toothpaste for children below 3 years.
Conclusion: Dental practitioners had less knowledge and attitude regarding the use of fluoridated toothpastes for children.

Keywords: Attitude, Knowledge, Fluoride Toothpaste, Dental practitioner.

Introduction
Dental caries can begin early in life and the main etiology behind are frequent intake of sugars, improper feeding and lack of oral hygiene measures. Children suffering from caries as infants & toddlers have a greater probability of subsequent caries in both primary & permanent dentition, so in order to prevent this, dental practitioners have a key role in promoting preventive measures against dental caries.

Among the various caries preventive strategies used, fluoride therapy has been the most effective method. During the last few years, there has been substantial decrease in caries and increased incidence of fluorosis and this has lead to greater attention and importance of topical fluoride therapy. Featherstone et al 1988 stated that the most important anti-caries effect of fluoride is considered to result from its action on tooth or plaque interface through promotion of remineralization of early caries & reducing enamel solubility[1]. Topical fluoride therapy can be given either by the use of fluoridated toothpastes, mouthrinses, gels and varnishes. Use of fluoride toothpaste has been the most recommended method to control and prevent dental caries. The lack of knowledge and awareness among dental practitioners regarding the use of fluoride toothpaste for younger children has lead to inconsistent and conflicting recommendations to the caregivers of children thus limiting its efficacy. Hence the goal of this study was to evaluate the knowledge and attitude among dental practitioners regarding the use of fluoridated toothpaste for children.

Materials and Methods
A web based cross-sectional survey was conducted among licensed dental practitioners in Kerala. A simple random sampling was done and a sample size of 300 dental practitioners was decided. The survey ensured confidentiality as no personal information on the participants' identity was disclosed. The questionnaire was prepared by the researcher and consisted of 16 questions, which was organized into two parts: the first three questions elicited information on the demographic attributes of dental practitioner including age, gender, and qualification. The rest 13 close ended questions assessed the participant's knowledge and attitude regarding the use of fluoride toothpaste in children. The questionnaire included

multiple-choice questions in which the respondents were instructed to choose only one appropriate response from a provided list of options.

Results

Responses of the study subjects on questions based on their knowledge and attitude regarding the use of fluoride toothpastes for children are tabulated in Table 1. Among the study subjects, 40% of the respondents considered that it is very important to brush child's teeth with fluoride toothpaste. Whereas 66% of them knew that atleast 1000 ppm fluoride should be present in toothpaste for getting its benefit. 70% of the respondents recommended Kid's fluoride toothpaste for children and only 18% recommended regular fluoride toothpaste. About 45.3% were sure that kid's fluoride toothpaste has enough fluoride for getting its benefit whereas 13.6% do not think Kid's toothpaste have enough fluoride for its benefits. 20.3% of them think kid's toothpaste contains 1000 ppm fluoride. 60.7% knew about the symptoms seen when high amounts of fluoridated toothpaste were ingested. 52.3 % knew how to manage a child who had ingested high amounts of fluoride toothpaste. 64.7 % knew how to reduce the intake of toothpaste by children. 66 % of the dentists suggest brushing twice daily with fluoride toothpaste. 55 % of them suggested pea sized toothpaste and 41 % suggests smear sized/size of grain for children below 3 years.

The results of the study revealed that the knowledge and attitude among dental practitioners regarding the use of fluoride tooth paste for children was less.

Table 1: Multiple choice questions based on knowledge and attitude

Multiple choice questions based on knowledge and attitude	**Percentage**
Do you think it is important to brush child's teeth with fluoride toothpaste?	
Yes, very important	40%
Yes, quite important	45.4%
Not important	8.6%
Do not know	6%
Fluoride in toothpaste has which of the following actions?	
Protects the tooth against demineralization	5%
Helps in remineralization	6%
Makes the tooth more resistant to dental caries	19%
All of the above	70%
Which ingredient in toothpaste provides protection against dental caries?	
Calcium carbonate	5.7%
Sodium lauryl sulphate	5.6%
Sorbitol	1.7%
Sodium fluoride	87 %
How much fluoride should be present in toothpaste for getting its benefits?	
5000 ppm	6%
> 5000 ppm	6%
1000 ppm	66%
400-700 ppm	22%
Do you think kid's fluoride toothpaste have enough fluoride for getting its benefit?	
Very much sure	14.4%
Sure	45.3%
No	13.6%
Do not know	26.7%
What type of toothpaste do you suggest for a child?	
Non Fluoride Toothpaste	10.3%
Fluoride Toothpaste	18%
Kid's Fluoride Toothpaste	70%
Ayurvedic Toothpaste	1.7%
How much fluoride does kid's toothpaste contain?	
1000 ppm	20.3%
> 1000 ppm	18.7%
<500 ppm	33.7%
400- 700 ppm	27.3%
If a child had ingested high amounts of fluoridated toothpaste, does it cause any of the following symptoms?	
Nausea, vomiting	21.3%
Abdominal pain, diarrhea	17.7%
Fall in blood pressure	0.3%
All of the above	60.7%
How do you manage a child who had ingested high amounts of fluoride toothpaste?	
Refer to the nearby hospital	16.66%
Induce vomiting	9.33%
Give milk	21.66%
All of the above	52.33%

Do you think any of the following methods can reduce the accidental ingestion of toothpaste by children?

Parental supervision	25%
Use toothpastes with low fluoride	2.7%
Using the right amount of toothpaste	7.7%
All of the above	64.7%

How many times do you suggest a child to brush their teeth per day?

Once daily with fluoride toothpaste	4.3%
Twice daily with fluoride toothpaste	66%
Thrice daily with fluoride toothpaste	0.3%
Once with fluoride toothpaste and once with non fluoride toothpaste	29.3%

How much toothpaste do you suggest for a child who is less than 3 yrs?

Pea sized	55%
Smear/ size of grain	41%
Toothpaste covering half of toothbrush head	4%
Toothpaste covering the entire toothbrush head	0%

How much toothpaste do you suggest for a child who is more than 3 years of age?

Smear/ size of grain	19%
Pea sized	72%
Toothpaste covering the entire toothbrush head	8%
Add toothpaste twice on the toothbrush.	1%

Discussion

The use of fluoride toothpaste is the most cost-effective fluoride homecare measure and there is strong evidence for a dose-response relationship.[2] Many researchers have found that brushing with fluoride toothpaste reduces dental caries in school-aged children but fluoride toothpaste use at an early age can be associated with dental fluorosis [3]. Younger children less than 3 years are likely to ingest toothpaste while brushing; this is the reason why many dental practitioners hesitate to prescribe fluoride toothpaste.

Although many studies are evaluating the efficacy of fluoridated toothpaste in children, still there is a lack of information within the dental community regarding the use, safety and efficacy of fluoridated toothpaste for younger children. Hence the present study evaluated the knowledge and attitude among dental practitioners regarding the use of fluoride toothpaste in children.

In this study, about 40 % of them considered that it is very important to brush the child's teeth with fluoride toothpaste. 70 % of the respondents knew about the protective action of fluoride on teeth against dental caries. A meta-analysis by Marinho *et al* [2] observed a significant reduction in caries with the use of fluoride toothpaste when compared with non-fluoride toothpaste or no toothpaste at all. A meta-analysis of eight clinical trials on caries increment in preschool children also showed that tooth brushing with fluoride toothpaste significantly reduces dental caries prevalence in the primary dentition [3].

Researchers have shown that using fluoride toothpaste containing at least 1000 ppm is essential for getting its benefit against dental caries. A review by Wong *et al* [4] found evidence of a statistically significant benefit of using 1000 ppm fluoride or more toothpaste relative to 250 ppm fluoride toothpaste for caries prevention in the mixed/permanent dentition. Similar results were found in the other two reviews (Ammari *et al* [5], 2003; Steiner *et al* [6], 2004).In this study, 66 % were aware that at least 1000 ppm fluoride should be present in toothpaste for getting its benefit, 70 % of them suggested Kid's fluoride toothpaste which has less than 1000 ppm fluoride whereas only 18 % suggested regular fluoride toothpaste for children.

The commercially available Kid's fluoridated toothpaste contains less than 1000 ppm of fluoride which is of less benefit for the teeth against dental caries. In this study, 20.3 % of them thought that Kid's fluoridated toothpaste contained 1000 ppm of fluoride. About 14.4 % were very much sure that kid's toothpaste has enough fluoride for getting its benefit whereas only 13.6 % did not think Kid's toothpaste has enough fluoride for its benefits. This shows the lack of knowledge among dental practitioners regarding the concentration of fluoride in Kid's toothpaste.

Nausea, vomiting, diarrhea, fall in blood pressure are some of the symptoms seen when fluoride toothpaste is ingested in high amounts. 60.7 % of the respondents were aware of these symptoms.

In this study, 66 % of the respondents in this study suggested twice daily brushing with fluoride toothpaste for children. To maximize the beneficial effect of fluoride in the toothpaste, AAPD suggests supervised tooth-brushing twice daily and rinsing after brushing should be kept to a minimum or eliminated altogether [7]. Parental supervision while tooth brushing, using toothpaste with low fluoride and using the right amount of toothpaste can reduce the incidence of

Table 2: Recommendations on the use of Flouride toothpaste for children according to AAPD [8] guidelines 2019-2020

Age of the child	Amount of toothpaste	Amount of fluoride present	Frequency of tooth brushing
Less than 3 years	No more than **Smear or rice sized** (0.1 g of toothpaste)	0.1 mg Fluoride	Twice daily brushing.
3-6 years	No more than **Pea- sized** (0.25 g of toothpaste)	0.25 mg Fluoride	Twice daily brushing.

*To maximize the beneficial effect of fluoride in the toothpaste, AAPD suggests supervised tooth-brushing twice daily and rinsing after brushing should be kept to a minimum or eliminated altogether

fluoride toxicity in children. In this study, 64.7 % of the respondents were aware of how to reduce the intake of toothpaste by children and 52.3 % of them knew how to manage a child who had ingested high amounts of fluoridated toothpaste which shows moderate knowledge and attitude in this regard.

American Academy of Pediatric Dentistry (AAPD) latest guidelines [8] recommendations are tabulated in Table 2. AAPD recommends using no more than a smear or rice-size amount of fluoridated toothpaste for children less than three years of age may decrease the risk of fluorosis. Using no more than a pea-size amount of fluoridated toothpaste is appropriate for children aged three to six [9]. The ADA currently advises to brush with water and to consult with a dentist or physician before using fluoride toothpaste, for children younger than 2 years. ADA Council recommends the use of smear of fluoride toothpaste (approximately 0.1 gram of toothpaste or 0.1 milligram of fluoride) from eruption of the first tooth to age 3 years followed by the use of pea-sized amount (0.25 g of toothpaste or 0.25 mg fluoride) for children aged 3 to 6 years. This regimen is intended to maximize the caries preventive benefits of fluoride while further reducing the risk of developing fluorosis. The optimal dose of fluoride is 0.05 mg per kg per day [10]. In this study, 55 % of the respondents suggested pea-sized toothpaste and 41 % suggested smear sized/size of grain for children below 3 years which shows a lack of knowledge among dental practitioners regarding the recommended amount of fluoride toothpaste for young children.

Conclusion

The use of fluoride toothpaste should be emphasized since fluoride is topically effective in preventing caries. In this study, dental practitioners have less knowledge and attitude mainly regarding the type of toothpaste and the amount of fluoride toothpaste to be prescribed for children. This study shows that dental practitioners lack knowledge regarding the use of fluoride toothpaste in children which needs appropriate steps to improve their knowledge by conducting dental health education. Better knowledge in this regard will enable dental practitioners to make appropriate decisions on the use of fluoride toothpaste in children.

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None.

Conflict of interest

None

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