

## Knowledge attitude and practice of Indian dentists on topical fluoride application in children

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### Abstract

**Objectives:** To assess the knowledge, attitude and practice of dentists towards Topical fluoride application in Delhi, National Capital Region (NCR).

**Materials and Method:** A self-made questionnaire was designed in a manner through which Knowledge, Attitude and Practice of the practitioners on topical fluoride application could be studied. The validated questionnaire was mailed to 100 dentists. Data were analysed using SPSS version 20 for inferential statistics and Spearman's correlation coefficient.

**Results:** 70 Of 100 respondents filled the questionnaire. Majority of the practitioners who were enrolled in the study were paediatric dentists (50.7%), followed by General practitioners (31.9%). Majority of the dentists (71%) did not face any difficulty in integrating preventive procedure in their practice. Acidulated phosphate fluoride (APF)/Sodium Fluoride (NaF) gel was the preferred choice amongst the practitioners. Most of the dentists had a positive attitude regarding practicing preventive procedure and thought it is for the betterment of their patient. There was no correlation found in the knowledge and attitude scores as well as attitude and practice scores.

**Conclusion:** Dentists had average knowledge and positive attitudes towards fluoride application. Paediatric dentists were more knowledgeable towards practising preventive dentistry and were more likely to manage the high-risk patients more efficiently.

**Keywords:** Fluorides, Risk, Caries management.

### Introduction

Dental caries is a major health problem in most industrialized countries and is thought to affect 60-90% of school aged children. The treatment of oral disease using traditional methods is costly and in industrialized countries currently rates the fourth most expensive disease to treat. Over a period of time, management of dental caries has evolved from a conventional to a more evidence based approach. Modern dentistry focuses on preventive methods and conservative techniques to apply less-invasive procedures to tooth structure. Awareness towards the importance of preserving tooth tissue combined with a patient-friendly approach is becoming self-evident.<sup>(1)</sup> It has been shown that operative dental treatment often leads to an increasing scale of more surgical and invasive treatments. The advances made in dental technology have made secondary and tertiary level preventive care more evident. However, little information exists on how primary preventive dentistry is being practiced in dental clinics in India and where preventive oral health services are placed on the priority scale by dental practitioners.

Topical fluoride application is the most effective preventive method against caries, and its effectiveness in preventing and reversing incipient dental caries is well documented.<sup>(2)</sup>

Topical fluorides in the form of solutions, gels, prophylaxis pastes, varnishes and rinses are widely used by dental practitioners. The reasons for the popularity of these procedures are presumably the perceived ease

of use by the operator with a relatively good financial return, acceptance by patients and the effectiveness of the procedures in caries reduction reported in the literature.<sup>(3)</sup>

According to the Centre for Disease Control (CDC) "the laboratory and epidemiologic research" that has led to the better understanding of how fluoride prevents dental caries indicates that fluoride's predominant effect is post-eruptive and topical and that the effect depends on fluoride being in the right amount in the right place at the right time.<sup>(4)</sup>

Dentists are the main source of health information for the patients and they play an important role in rendering preventive care to the infants at the right stage. Given the changing state of knowledge and clinical recommendations relating to the use of fluoride products and prevention in general, the extent of dentists' knowledge and clinical practice is still uncertain as very few studies have been conducted in India to assess the same. Hence a study was carried out to assess the level of knowledge of dentists about systemic and topical effects of fluorides and their attitude towards its use and prescription of fluoride products.

### Materials and Method

Ethical approval for the study was obtained from the Institutional Ethics Committee of I.T.S-Centre for Dental Studies and Research, Ghaziabad, India. Seventeen-item questionnaire was mailed to dentists in Delhi NCR region and out of 100 mailed-out

questionnaires 70 (70%) were received back completely filled. Description of the questionnaire was explained by the researcher in the mail itself and willingness to fill the questionnaire indicated consent. Also, the link to the Google form website ([www.google.co.in/forms](http://www.google.co.in/forms)) was embedded within the mail. All the questions were kept anonymous.

**Questionnaire Structure:** A self-made questionnaire was designed in a manner through which Knowledge, Attitude and Practice of the practitioners on topical fluoride application can be studied. Questionnaire comprising of three sections based on the relevant literature was used in this survey.<sup>(2,3,4,6,9)</sup> Questions related to knowledge were designed from the American Academy of Paediatric Dentistry(AAPD) guidelines.<sup>(5)</sup>

The questions related to preventive practice of the dentist and attitude were adopted from previous surveys on similar topics. The questionnaire included 3 questions on knowledge, 8 questions to assess practice and 5 questions to estimate the attitude of dentists towards preventive dentistry.

To validate the questionnaire a pilot study was conducted on 10 dentists, none of them participated in the final data collection, any modification suggested in the question were recorded for final questionnaire formation.

**Knowledge based questions for Dentists:** The questions asked were designed to elicit knowledge regarding (1) American Dental Association (ADA) recommendation of topical fluoride application in children under 6 years of age (2) During which period of tooth development consuming fluoride has higher risk of dental fluorosis (3) Knowledge about tooth mousse or any other technology for remineralization.

The questionnaire consisted of demographic information including name, age, qualification and year in practise of the practitioner and which speciality they belong to.

**Attitude based questions for Dentists:** Attitude was assessed on the basis of the existence of alternative to topical fluoride application and its efficacy in children and adults and whether the practitioners feel that practising preventive dentistry is for betterment of their patient.

**Practice based questions for Dentists:** Last section evaluated the type of topical fluoride dentist preferred and whether the practitioners advocated topical fluoride application in children with active cavities or not.

**Statistical Analysis:** Data was entered in Microsoft Excel 2007 for descriptive statistics and imported to SPSS Statistics for Windows version 20 for inferential analysis. Percentages of correct answers for each aspect of Knowledge, Attitude and Practice were estimated.

Correlation between knowledge and attitude scores and knowledge and practice scores were estimated using Spearman's correlation coefficient.

## Results

Out of the 100 questionnaires mailed among the dentists, 70 dentists completed the questionnaire and were included in the study. Out of the 70 respondents 50.7% were Paediatric dentist, 17.4% were General dentists and the remaining 31.9% were from other specialities.

**Knowledge of Dentists:** When questioned about the period of tooth development during which consuming fluoride has higher risk of dental fluorosis only 36.8% could answer it correctly i.e. 0-2 years.

53.6% of the dentists were aware about the ADA recommendation of topical fluoride application under 6 years of age, while 33.3% believed that topical fluoride application under 6 years was not recommended, 13% were not able to answer.

**Dentists Attitude towards topical fluoride application and its practice:** Of all the enrolled dentists 71% did not face any difficulty in integrating preventive procedure in their practice whereas 29% reported difficulty in the same. Majority of the practitioners (97.1%) felt that practicing preventive dentistry is for the betterment of their patient.

71% of the practitioners preferred Acidulated Phosphate Fluoride (APF)/ Sodium Fluoride (NaF) gel, 13% preferred fluoride varnish and only 10.1% opted for fluoride mouthwash when asked about their preference in topical fluoride application mode (Fig. 1).

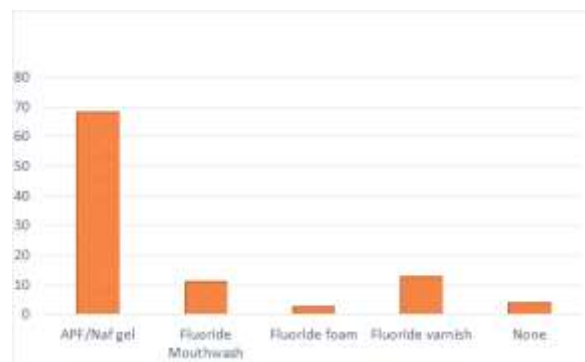


Fig. 1: Different methods of topical fluoride application preferred by practitioners

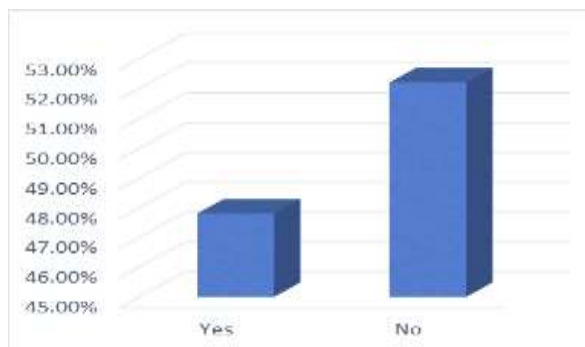


Fig. 2: Diagrammatic representation showing percentage of dentists attending educational seminars regarding fluorides

63.8% of the practitioners routinely advocated topical fluoride application in children with active cavities, but only 44.9% of the practitioners advocated topical fluoride in children without active cavities. (Fig. 3)

Only 48.5% of the respondents agreed that dietary fluoride supplement was effective whereas 26.5% disagreed to it and 25% were clueless about the same.

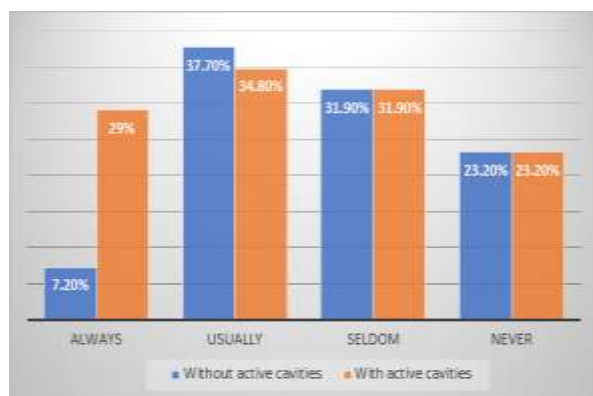
79.7% of the respondents were effectively aware about tooth mousse and other technologies for remineralization of incipient lesions in the tooth. However, only 47.8% of the dentists reported on receiving updates/ attending seminars regarding fluoride while 52.2% did not actively participate in it.

Only 20.6% of the respondents assessed the water fluoride level of the area in which the patient resides before topical fluoride application, strikingly 77.6% of the dentists believed that assessing water fluoride level of the patient's area should affect topical fluoride application.

The Knowledge scores were not correlated to Attitude scores, similarly the Attitude score were not significantly correlated to Practice scores (Table 1).

**Table 1: Spearmans Correlation Coefficient analysis of Knowledge, Attitude and Practice scores**

	Attitude
Knowledge Correlation Coefficient	.077
Sig	.525
Practise Correlation Coefficient	.170
Sig	.164



**Fig. 3: Dentists advocating topical fluoride application in children with and without active cavities**

## Discussion

Our study presents us with a preview of current status of the knowledge of the dentists about preventive measures using topical fluorides. Also, it provides a perception regarding the attitude of the dentists towards the use of topical fluorides in their practice. The dentists were knowledgeable about the effects of topical and systemic administration of fluoride and had

positive attitude towards the preventive effect of fluoride especially in children is shown in our study.

Out of all the respondents 50.7% were paediatric dentists and 17.4% were General practitioners. Majority of practitioners (71%) did not experience any problem in integrating preventive procedures in their practice, whereas only 29% of them agreed to have experienced problem in integrating preventive procedures in their practice. This finding can be attributed to the fact that majority of the respondents involved in our study were paediatric dentists who have undergone rigorous training of preventive programmes like fluoride application.

Only 53.6% practitioners were aware of ADA recommendation about the application of topical fluoride in children below 6 years of age and only 36.8% of the dentists were able to correctly answer when questioned about the period of tooth development during which consuming fluoride had higher risk of dental fluorosis, this shows lack of diffusion of information amongst the dentists in our study.

However according to a study conducted in Vadodara by Ramya R et al<sup>(6)</sup> majority of study subjects (80.49%) exhibited average knowledge level.

CDC has given guidelines on recommendation for using fluorides to prevent and control dental caries, which were published in 2001 and also summarized in the Journal of the American Dental Association (JADA) (2006).<sup>(7)</sup>

In a study conducted in Indiana on 6,681 dentists and dental hygienists, use of fluoride in children and adults with and without active or recent caries was evaluated, in which they found that 95% respondents administered fluoride therapy for children with active caries while 62% of respondents reported the use of fluoride for adult patients with the same conditions.<sup>(8)</sup>

However, according to our study only 34.8% practitioners advocated topical fluorides in children with active caries and 7.2% without active caries.

In another study done in Texas by Bansal et al<sup>(9)</sup> 94% of American dentists reported that they routinely perform fluoride therapy in their clinics. 20% of the respondents were in agreement with the recommendation that topical fluoride application is not beneficial for low risk patients. 93% correctly responded that topical fluoride should be prescribed every three to six months for high-risk children under six years of age.

According to the AAPD Guidelines 2014,<sup>(5)</sup> 5% sodium fluoride varnish (NaF; 22,500 ppm F) and 1.23% Acidulated Phosphate Fluoride (APF; 12,300 ppm F), are the most commonly used agents for professionally-applied fluoride treatments.

According to our study APF gels were the most preferred choice of the type of topical fluoride application for dental practitioners (71%) followed by varnish (13%) and Fluoride mouthwash (10%).

Similarly, 66% of dentists preferred APF/NaF gel for their routine dental practice according to Bansal et al.<sup>(9)</sup>

As stated by CDC, it is important to monitor the fluoride intake of children younger than six years old, as the first six years of life is an important period for tooth development. Overuse of fluoride during this period can result in enamel fluorosis, a developmental condition of tooth enamel that may appear as white lines or spots.<sup>(7)</sup>

For children who live in communities that have high fluoride content in their water supply, supplements and high-concentration fluoride products should be used judiciously.<sup>(7)</sup>

However, in our study only 20.6% of the respondents assessed the water fluoride level of the area in which the patient resides before topical fluoride application.

In our study only 47.8% of the dentist received updates or attended seminars on topical fluorides application in contrast to 62.20% of participants as reported by Ramya R et al<sup>(6)</sup> in 2015. However, attending CDE programmes on preventive dentistry was not found to significantly affect practitioners' knowledge on preventive dentistry.<sup>(6)</sup> This observation was in concordance with the study results of Ghasemi H et al<sup>(10)</sup> among Iranian dentists that reported of no impact on knowledge level of the dentists through participation in CDE programmes on preventive dentistry.

The knowledge and attitude scores of this study were not significantly correlated inferring to the fact that greater knowledge scores do not assure a better practice and vice versa.

### Limitation of the study

The chances of bias increases in questionnaire surveys due to over representation of responding dentists. Also, dentists tend to present themselves in a manner which is more socially acceptable, so that it gives an impression that they practice preventive procedures in their clinical practice. Poor response rate was another important limitation of the study.

### Conclusion

In spite of the universal recommendation of topical fluoride application in preventing dental caries, it has failed to become an integral part of Dental practice in India.

Although majority of the surveyed dentists were aware of the principles of preventive dentistry and showed favourable attitudes towards prevention, the practice of fluoride application was found to be unsatisfactory.

It also reflects the generalized attitude of Indian dentistry which focuses more on corrective treatments rather than the preventive ones.

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