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IP Annals of Prosthodontics and Restorative Dentistry

Journal homepage: <https://www.aprd.in/>

## Original Research Article

# Knowledge and attitude of general dental practitioners and pedodontists toward silver diamine fluoride in Maharashtra

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## ARTICLE INFO

## Article history:

Received 19-03-2024

Accepted 09-04-2024

Available online 15-05-2024

## Keywords:

Dental caries

Early Childhood caries

Pediatric Dentistry

## ABSTRACT

**Introduction:** Despite advancements in preventive dentistry, the prevalence of caries, particularly in pediatric populations, continues to be a significant public health challenge. Silver diamine fluoride (SDF) has emerged as a promising and cost-effective intervention in preventing and managing dental caries, demonstrating notable success in arresting the progression of cavities. The present study aims to investigate the knowledge and attitudes of general dental practitioners (GDP) and pedodontists in Maharashtra concerning silver diamine fluoride.

**Materials and Methods:** The present cross-sectional study was conducted using a 10-point questionnaire comprising questions relevant to the knowledge and attitude of general practitioners and pediatric dentists regarding the use of SDF. The survey was circulated to 578 dental professionals of which 332 opted to fill out the form, making the survey response rate of 57.44%. The datasheet of responses was extracted through Google Sheets and subjected to statistical analysis.

**Results:** The study population (n=295) comprised 249 GDP and 46 Pediatric dentists. Despite 75.6% of respondents being aware of SDF, only 43.7% were aware of the Silver-modified atraumatic restorative technique. The awareness about both, the advantages as well as disadvantages of SDF was significantly lower (p<0.05) among GDP. About 42% of respondents (n=124) were not aware of the fact that SDF application does not require local anesthetic or drilling.

**Conclusion:** Findings from the present study highlight significant differences in knowledge levels between GDPs and pediatric dentists, emphasizing the need for targeted educational interventions tailored to the distinct needs of each group. Addressing these knowledge gaps is essential for promoting informed decision-making and optimizing the integration of SDF into routine dental practice.

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## 1. Introduction

Dental caries remains the most prevalent chronic global disease globally, affecting individuals across diverse age groups.<sup>1,2</sup> Its occurrence affecting the primary or even permanent dentition in children, particularly in the form of early childhood caries, is a cause for grave concern.<sup>2,3</sup>

A lot of intervention and preventive strategies have been developed over the years in an attempt to tackle the malice.<sup>4,5</sup>

Despite advancements in preventive dentistry, the prevalence of caries, particularly in pediatric populations, continues to be a significant public health challenge.<sup>6-8</sup> The difficulty of performing dental treatment is amplified considering the reluctance of children to comply during the procedures. Therefore, preference has been given to

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non-invasive methods that promote caries arrest rather than excavating the caries.<sup>9</sup>

Silver diamine fluoride (SDF) has emerged as a promising and cost-effective intervention in preventing and managing dental caries, demonstrating notable success in arresting the progression of cavities.<sup>9,10</sup> It is applied in concentrations of 38% to the carious lesions which is effective in arresting the lesion.<sup>11</sup> The most significant drawback of SDF is the potential blackish discoloration of tooth making it an unsuitable choice of treatment for carious lesions in the anterior teeth.<sup>12</sup>

Dental professionals play pivotal roles in disseminating preventive oral care, and their knowledge and attitudes towards emerging treatment modalities are essential factors influencing the incorporation of innovative approaches into clinical practice. As silver diamine fluoride gains recognition for its potential in managing dental caries, it is imperative to bridge the gap between scientific evidence, clinical application, and professional preferences.

The present study aims to investigate the knowledge and attitudes of general dental practitioners (GDP) and pedodontists in Maharashtra concerning silver diamine fluoride. By exploring their familiarity with the material, assessing their understanding of its application, and gauging their attitudes toward its incorporation into their practice, the study holds an objective to provide valuable insights that can aid in shaping professional development programs and academic initiatives. This would, in the long run, enhance the quality and outcome of the oral health care provided to pediatric patients.

## 2. Materials and Methods

The present cross-sectional study was conducted using a 10-point questionnaire comprising questions relevant to the knowledge and attitude of general practitioners and pediatric dentists regarding the use of SDF. The questionnaire was pilot-tested on a homogenous population of 20 dental practitioners and Cronbach's alpha value of 0.81 indicated good reliability and face validity of the questionnaire.

An e-questionnaire was prepared using Google Forms which was circulated through online social media platforms to general practitioners and pediatric dentists. The survey was circulated to 578 dental professionals of which 332 opted to fill out the form, making the survey response rate of 57.44%. Of these, 12 participants did not consent to proceed with the study and 25 chose to opt out of the survey process. At the end, n=295 participants completed the survey.

The datasheet of responses was extracted through Google Sheets and subjected to statistical analysis, using Statistical Package for Social Sciences (SPSS v 26.0, IBM). Descriptive statistics like frequencies and percentages for categorical data have been depicted. Comparison of

frequencies of categories of variables with groups was done using the Chi-square test. For all the statistical tests, the  $\alpha$  error was maintained at 5%, and  $\beta$  error at 20%, thus giving power to the study as 80%, considering the p-value <0.05 to be of statistical significance.

## 3. Results

The study population (n=295) comprised 249 GDP and 46 Pediatric dentists. About n=223 of respondents were aware of SDF and undergraduate course was reported to be the most common source (n=105). Other sources included post-graduate course (n=46), Internet/self-learning/article (n=43), and Scientific conferences/symposiums (n=12).

Despite 75.6% of respondents being aware of SDF, only 43.7% were aware of the Silver-modified atraumatic restorative technique (SMART). A statistically highly significant difference (p<0.01) was noted wherein a greater proportion of GDP were unaware of SMART as compared to pediatric dentists.

The 38% concentration of fluoride in SDF was correctly identified by only 28.1% (n=83) of respondents. There was a statistically highly significant difference seen for the frequencies between the groups (p<0.01) with a higher frequency of GDP unable to identify the correct concentration of SDF as compared to pediatric dentists.

The responses concerning awareness about the advantages and disadvantages of using SDF as stated by GDP and pediatric dentists are summarized in Table 1. The awareness about both, advantages as well as disadvantages of SDF was significantly lower (p<0.05) among GDP. About 42% of respondents (n=124) were not aware of the fact that SDF application does not require local anesthetic or drilling.

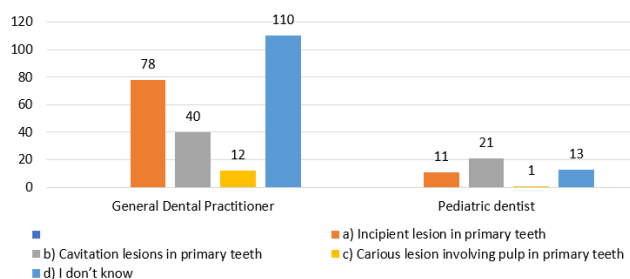
SDF is indicated in enamel and dentinal caries; however, its use is not recommended when symptomatic inflammation of the pulp is present. This was identified correctly by 44.1% respondents (n=130). Figure 1 indicates responses given by GDP and pediatric dentists regarding the indications of SDF. A statistically significant difference was noted with greater frequency of GDP being unaware of the indications and contraindications of SDF. SDF requires only biannual application which was correctly answered by n=82 (27.8%) respondents.

## 4. Discussion

The persistent prevalence of dental caries, especially in pediatric populations, despite ongoing advancements in preventive dentistry, highlights the need for effective and innovative interventions. The reluctance of pediatric patients to comply during dental procedures poses a considerable challenge, making non-invasive approaches such as SDF more attractive for practitioners.<sup>3</sup> The

**Table 1:**

Advantages of SDF	General Dental Practitioner	Pediatric dentist	Total
a) Fluoride release	63	4	67
b) Caries arresting	82	29	111
c) Esthetically pleasing	6	0	6
d) I don't know	91	13	104
<b>Disadvantages of SDF</b>			
a) Staining of teeth	73	32	105
b) Irritation to pulp	23	1	24
c) Low PH	18	0	18
d) I don't know	108	10	118
e) All of the above	18	3	21



**Figure 1:** Which of the following is indication of SDF?

observed success of SDF in arresting the progression of cavities proved by previous researchers, has popularized its potential as a valuable tool in preventive oral care. The incorporation of innovative treatment modalities into clinical practice is contingent on the knowledge and attitudes of dental professionals. Therefore, the present study reveals a crucial aspect of this process, elucidating the level of familiarity with SDF among practitioners and their perceptions regarding its application.

A notable finding of the study is the high level of awareness of Silver Diamine Fluoride (SDF) among the respondents, with 75.6% (n=223) indicating familiarity with this material. This widespread awareness suggests a growing recognition of SDF as a relevant intervention in dental practice, particularly in the context of caries management. The identification of sources through which practitioners acquired knowledge about SDF further elucidates the avenues through which information is disseminated within the dental community.

Among the various sources of information, undergraduate dental course emerged as the most common, with 35.6% (n=105) of respondents citing their undergraduate academics as a primary channel for acquiring knowledge about SDF. This underscores the importance of foundational dental education in shaping the awareness and understanding of emerging dental technologies and materials.<sup>13</sup> The influence of undergraduate education highlights the potential for curricular enhancements to include comprehensive coverage of innovative interventions

like SDF, ensuring that future generations of dental professionals are well-versed in their applications.

Naturally, the postgraduate course in pediatric dentistry would provide in-depth knowledge about the utility of SDF to the professionals which was also observed in the present study. The role of self-directed learning and online resources is evident, with 14.6% of respondents attributing their knowledge of SDF to the Internet, self-learning, or articles. This finding reflects the changing landscape of information dissemination within the digital age, where practitioners have access to a wealth of resources beyond traditional educational channels.<sup>14</sup> The reliance on online platforms emphasizes the importance of incorporating digital and online resources into continuing education efforts to reach a broader audience of dental professionals. Scientific conferences and symposiums were identified as a source of information by 4.1% of respondents. While a relatively smaller percentage, this highlights the significance of professional gatherings in knowledge dissemination. Conferences and symposiums provide opportunities for networking, exposure to cutting-edge research, and direct interaction with experts in the field, contributing to the continuous education and awareness of practitioners.

SDF is commonly employed in 38% concentration in dentistry which was correctly identified by only 28.1% of the respondents (n=83). This finding indicates a notable gap in understanding the specific composition of SDF among dental practitioners in Maharashtra. Furthermore, the fact that in the present study, a higher proportion of GDP demonstrated an inability to identify the correct concentration of SDF highlights the need for targeted educational interventions, especially for GDP, to enhance their knowledge and awareness regarding the chemical composition of SDF.

GDP exhibited a lower awareness regarding all the aspects of SDF including its indications, contra-indications, advantages, and disadvantages of SDF as compared to pediatric dentists. This discrepancy suggests a potential gap in the dissemination of information or exposure to comprehensive training on the use of SDF, particularly

within the general dental practitioner community.<sup>15</sup> Of significance is the finding that 42% of the respondents were not aware that the application of SDF does not necessitate local anesthesia or drilling. This lack of awareness among a substantial proportion of the participants underscores the importance of addressing misconceptions and knowledge gaps related to SDF application. The fact that SDF can be applied without the need for local anesthesia or drilling is a key advantage, particularly in Pediatric Dentistry, where procedural challenges often arise due to patient apprehension and cooperation issues.<sup>16</sup>

The observed differences in knowledge levels between GDP and pediatric dentists emphasize the need for targeted educational interventions tailored to each group. Continuing education programs should focus on elucidating the unique advantages and disadvantages of SDF, ensuring that practitioners are well-informed about its specific applications and potential benefits. Moreover, efforts to bridge the knowledge gap related to the fluoride concentration in SDF are crucial for fostering a more accurate understanding among dental professionals.

## 5. Conclusion

The present cross-sectional questionnaire-based study provides valuable insights into the knowledge and attitudes of GDPs and pediatric dentists in Maharashtra regarding Silver Diamine Fluoride (SDF). The findings underscore the low prevalence of awareness about SDF. The study highlights significant differences in knowledge levels between GDPs and pediatric dentists, emphasizing the need for targeted educational interventions tailored to the distinct needs of each group. Addressing these knowledge gaps is essential for promoting informed decision-making and optimizing the integration of SDF into routine dental practice. The outcomes of this research contribute to the ongoing discourse on preventive dentistry and provide a foundation for future initiatives aimed at enhancing the quality of oral healthcare provided to pediatric patients in Maharashtra.

## 6. Source of Funding

None.

## 7. Conflict of Interest

None.

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**Cite this article:** Padawe D, Wankhade A, Takate V, Dighe K, Agrawal A, Sachdev SS. Knowledge and attitude of general dental practitioners and pedodontists toward silver diamine fluoride in Maharashtra. *IP Ann Prosthodont Restor Dent* 2024;10(2):140-144.