



# Knowledge, Attitude and Practice of Preventive Pedodontic Procedures among General Dentists: A Questionnaire-Based Study Performed in and around Chennai.

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## ABSTRACT

**Introduction:** This questionnaire-based cross-sectional study explores general dentists' knowledge, attitudes, and practices regarding preventive pedodontics in India. Given the critical role of preventive measures in pediatric dental care and the variability in practices and guidelines, this study aims to assess how these factors influence preventive strategies. With no standardized national guidelines in India for preventive pedodontics, understanding the current practices and knowledge gaps among general dentists is essential for improving pediatric oral health outcomes.

**Methodology:** A cross-sectional design was used to survey 214 general dentists across India. The questionnaire gathered data on demographic information, professional experience, familiarity with preventive measures, and the application of preventive strategies in clinical practice. Ethical standards were maintained through informed consent, confidentiality protocols.

**Results:** The analysis revealed significant associations between demographic factors and preventive practices. Variations in practices were observed based on age, years in practice, and educational qualifications, with younger practitioners and those with less experience showing different preventive strategies. The study identified a range of preventive measures used, including fluoride applications, sealants, and newer technologies like Silver Diamine Fluoride. Adherence to local guidelines and challenges in implementing preventive care were also highlighted.

**Conclusion:** This study provides valuable insights into the factors influencing preventive pedodontic practices among general dentists in India. The findings emphasise the need for improved

educational programs, standardized protocols, and better adherence to guidelines. Addressing the identified gaps and challenges can enhance evidence-based practices and contribute to better preventive care in pediatric dentistry.

**Key words:** Preventive Pedodontics, General Dentists, Fluoride, SDF, CPP-ACP, Knowledge, Attitudes, Practices, Standardization, Educational Programs.

## I. INTRODUCTION:

Preventive pedodontics is a crucial field within dentistry, focusing on preventing dental diseases in children. Early implementation of preventive measures can significantly improve long-term oral health outcomes, making it essential to understand the knowledge, attitudes, and practices of general dentists regarding preventive pedodontic procedures. This understanding can help identify areas for improvement and design targeted interventions to enhance pediatric dental care. This study analyzes a dataset containing survey responses from general dentists in India, providing a comprehensive view of their approach to preventive pedodontics.[1]

The dataset includes key variables such as age, years in practice, educational qualification, specialty, caries prevention methods, familiarity with Silver Diamine Fluoride (SDF), recommended fluoride levels in toothpaste for children, treatment choices for white spot lesions, and usage of Casein Phosphopeptide-Amorphous Calcium Phosphate (CPP-ACP) agents. These variables are critical for assessing the level of knowledge, current practices, and attitudes towards preventive dentistry among general dentists. By examining these factors, the study aims to uncover trends and gaps in the current practices and readiness of general dentists to provide optimal pediatric dental care.[2]



Preventive pedodontic procedures encompass a range of practices aimed at maintaining and improving oral health in children.[3] These include routine dental check-ups, fluoride treatments, dental sealants, dietary counseling, and education on proper oral hygiene techniques. The effectiveness of these preventive measures is heavily dependent on the knowledge and attitudes of the dentists administering them.[4] Therefore, the knowledge of general dentists regarding preventive pedodontics is crucial, forming the foundation of their practice. This knowledge includes understanding the developmental stages of children's dentition, recognizing early signs of dental problems, and being aware of the latest advancements and recommendations in pediatric dental care. A well-informed dentist is more likely to implement effective preventive strategies and educate parents and children about the importance of maintaining good oral health.[5]

Attitudes towards preventive pedodontic procedures also play a significant role in their implementation. Positive attitudes and a strong belief in the importance and efficacy of preventive care can drive dentists to prioritize these measures in their practice.[6] Conversely, if dentists hold negative or indifferent attitudes towards preventive pedodontics, they may be less likely to recommend and perform these procedures, potentially compromising the oral health of their pediatric patients. The dataset includes responses on the feasibility of practicing preventive dentistry, which can provide insights into the perceived challenges and facilitators in implementing preventive care in different practice settings.[7]

Practices in preventive pedodontics refer to the actual application of preventive measures in clinical settings. This includes the frequency of recommending and performing preventive procedures, the use of educational materials and counseling during dental visits, and the dentist's approach to managing pediatric patients.[8] Consistent and comprehensive preventive practices are essential to achieving optimal oral health outcomes in children. The survey responses on caries prevention methods practiced, most prescribed caries prevention strategy, and treatment choice for white spot lesions offer valuable data on the practical aspects of preventive pedodontics among general dentists.[9]

The study's primary objective is to evaluate the knowledge, attitudes, and practices (KAP) regarding preventive pedodontic procedures among general dentists in and around Chennai. By analyzing the collected data, the study seeks to

identify gaps in knowledge, potential barriers to the implementation of preventive measures, and the overall readiness of general dentists to provide optimal pediatric dental care. The insights gained from this study can inform targeted interventions, continuing education programs, and policy recommendations aimed at enhancing the preventive dental care provided to children across Chennai.

## II. METHODOLOGY:

### Study Design

This study employed a cross-sectional questionnaire-based design to gather information from general dental practitioners in India regarding their knowledge, attitudes, and practices in preventive pedodontic procedures.

### Study Participants

The study included general dental practitioners across various settings, including those in private practice, postgraduate students, and those working in public dental services. The sample size consisted of 214 participants, providing a comprehensive view of the current practices and knowledge levels in preventive pedodontics.

### Data Collection

#### 1. Questionnaire Development

- The questionnaire was designed to gather detailed information on demographic characteristics, professional experience, and practices related to preventive pedodontics.

- Questions were structured to cover various aspects, including employment status, professional experience, caries prevention methods practiced, familiarity with Silver Diamine Fluoride (SDF), recommended fluoride levels in toothpaste for children, treatment choices for white spot lesions, and the use of Casein Phosphopeptide-Amorphous Calcium Phosphate (CPP-ACP) agents.

#### 2. Distribution of Questionnaires

- Participants were approached through professional networks, dental associations, and educational institutions.

- Informed consent was obtained from each participant before they were provided with the questionnaire.

#### 3. Data Collection Period

- The data collection period spanned a specific timeframe to ensure a comprehensive representation of responses.



## Variables

### Independent Variables

- 1. Employment status:** Categories included private practice, postgraduate student, and public dental service.
- 2. Professional experience:** Measured in years.
- 3. Caries prevention methods practiced:** Types of methods used to prevent dental caries in children.
- 4. Familiarity with SDF (Silver Diamine Fluoride):** Levels of awareness and knowledge about SDF as a preventive treatment for dental caries.
- 5. Recommended ppm of fluoridated toothpaste for children:** Knowledge of appropriate parts per million (ppm) of fluoride in toothpaste for children.
- 6. Treatment choice for white spot lesions:** Preferred treatment methods for early caries lesions, known as white spot lesions.
- 7. CPP-ACP agent usage:** Use of Casein Phosphopeptide-Amorphous Calcium Phosphate agents in preventive dental care.

### Dependent Variables

- 8. Knowledge of preventive pedodontic procedures:** Assessed through specific questions on familiarity and understanding of various preventive measures.
- 9. Attitudes towards preventive pedodontic procedures:** Measured by questions on the perceived importance and feasibility of implementing preventive dentistry.
- 10. Practices in preventive pedodontics:** Frequency and types of preventive procedures performed, use of educational materials, and counseling provided during dental visits.

This detailed study design ensures a comprehensive assessment of the knowledge, attitudes, and practices of general dentists in India concerning preventive pedodontic procedures. The findings can inform targeted interventions, continuing education programs, and policy recommendations aimed at enhancing pediatric dental care and improving oral health outcomes for children.

## III. STATISTICAL ANALYSIS:

The data analysis for this study was conducted using SPSS version 27. Descriptive statistics were employed to present a frequency distribution of demographic and professional characteristics of the surveyed general dentists. Additionally, percentages were calculated to illustrate the prevalence of various preventive pedodontic practices and the familiarity with

specific preventive measures among the respondents. Inferential statistics, specifically Chi-square tests, were utilized to explore potential associations between demographic and professional factors and the dentists' knowledge, attitudes, and practices regarding preventive pedodontics. The significance level was set at  $p < 0.05$ . This approach ensured a comprehensive analysis of the data, highlighting key trends and significant relationships within the dataset.

## IV. RESULTS:

The survey data on general dentists' knowledge, attitudes, and practices regarding preventive pedodontics in India reveals a comprehensive snapshot of the current landscape in this field. The analysis shows that the mean age of respondents is 23.38 years, with a standard deviation of 5.41 years, suggesting that the sample is predominantly comprised of young practitioners. The median age is 22.00 years, and the mode is 21.00 years. Ages range from 18 to 58 years, with most respondents being in their early twenties. This indicates a relatively young workforce in the field of dentistry.

In terms of practice experience, a significant majority of respondents (85.45%) have been practicing for less than 5 years. A smaller percentage, 9.86%, have between 5 and 10 years of experience, while only 2.82% have between 10 to 15 years, and a mere 1.88% have been practicing for more than 15 years. This distribution underscores the prevalence of relatively new practitioners in the field.

Educational qualifications among respondents show that a large majority (82.16%) hold a Bachelor of Dental Surgery (BDS) degree, while 17.84% have attained a Master of Dental Surgery (MDS). This indicates that the majority of dentists in the sample have basic dental qualifications, with a smaller proportion holding advanced degrees.

When examining the caries prevention methods practiced, 8.45% of respondents reported engaging in diet counseling, 18.78% in fluoride application, and 24.41% in the application of pit and fissure sealants. The most commonly prescribed caries prevention strategy is the use of fluoridated toothpaste, as indicated by 51.17% of respondents. This is followed by topical fluoride application (25.35%), pit and fissure sealants (14.08%), and remineralizing agents (7.51%).

The feasibility of practicing preventive dentistry is strongly supported by a significant majority (87.79%) of respondents, indicating a positive outlook on integrating preventive measures



into clinical practice. However, challenges do exist, including difficulties in convincing patients (47.42%), predicting outcomes (19.72%), time-consuming nature of procedures (17.84%), and lower profitability (15.02%).

Regarding familiarity with Silver Diamine Fluoride (SDF), 66.20% of respondents are aware of it, while 33.80% are not. The survey also reveals varying opinions on the appropriate timing for fissurotomy and sealant application, with 43.66% of respondents recommending both as soon as the tooth erupts and after initial enamel breakdown, 35.21% preferring after initial enamel breakdown, 15.96% suggesting as soon as the tooth erupts, and 5.16% not recommending it at all.

Familiarity with CPP-ACP agents is noted among 71.83% of respondents, while 9.39% are not familiar with them, and 18.78% are unsure. Commonly used preventive materials include APF gel (44.13%), fluoride varnish (30.52%), and fluoridated toothpaste (25.35%). In terms of usage, 43.19% of respondents use CPP-ACP agents, while 56.81% do not. The recommended fluoride concentration in children's toothpaste varies: 41.78% recommend 300 ppm, 30.05% recommend 1000 ppm, 22.54% recommend 500 ppm, and 5.63% recommend 900 ppm.

For treating white spot lesions, 27.23% of respondents prefer fluoride application, 29.58% use remineralizing agents, 23.00% use the resin infiltration technique, 15.02% are unsure, and 5.16% opt for restoration. Preferences for CPP-ACP agents vary as well, with 21.13% preferring Toothmin Toothcreme, 28.64% preferring 3M Clinpro Toothcreme, 17.37% preferring GC Tooth

Mousse, and 32.86% not using any of these agents. Preventive procedures are predominantly practiced in the age group of 6 to 12 years (65.73%), followed by 0 to 5 years (20.19%), 13 to 20 years (10.80%), and above 20 years (3.29%).

Inferential statistics reveal significant associations in several areas. The Chi-square tests identified significant relationships regarding challenges in practicing preventive dentistry ( $p=0.045$ ), commonly used preventive materials ( $p=0.027$ ), recommended fluoride concentration in children's toothpaste ( $p=0.046$ ), preferred treatment for white spot lesions ( $p=0.011$ ), and preference for CPP-ACP agents ( $p=0.006$ ). (Table No.1). However, no significant relationship was found between "Years in Practice" and the "choice of caries prevention method" ( $\chi^2 = 41.191, p = 0.634$ ), suggesting that the length of practice does not significantly influence the choice of caries prevention methods.(Table No.2)

The feasibility of practicing preventive dentistry was strongly supported ( $z = 16.85, p = 0.0000016$ ), while familiarity with SDF significantly increased with years in practice ( $z = 12.83, p = 0.000001$ ), highlighting the importance of experience in understanding and utilizing SDF. The findings suggest that while general dentists are generally knowledgeable and supportive of preventive dentistry, there are notable gaps in familiarity with specific measures and challenges that need to be addressed. Enhancing educational programs and targeted interventions could help bridge these gaps and improve pediatric oral health outcomes in Chennai.

**Table No. 1.Question wise responses analysis:**

Questions	Statistic	df	p
1	3.68	2	0.066
2	2.55	3	0.084
3	1.32	1	0.412
<b>4</b>	<b>3.32</b>	<b>3</b>	<b>0.045*</b>
5	3.09	1	0.199
6	2.84	3	0.065
7	1.71	2	0.229
<b>8</b>	<b>5.95</b>	<b>2</b>	<b>0.027*</b>
9	7.34	1	0.086
<b>10</b>	<b>3.3</b>	<b>3</b>	<b>0.046*</b>
<b>11</b>	<b>4.48</b>	<b>4</b>	<b>0.011*</b>
<b>12</b>	<b>7.11</b>	<b>3</b>	<b>0.006*</b>
13	1.78	3	0.172
Note. $H_a \mu \neq 0$ ; * $p < .05$ - Significant			



**Table No. 2. Association between Years in Practice and Caries Prevention Methods:**

Years in Practice	Diet Counselling (B)	Diet Counselling; None (C)	Diet Counselling; Use of Remineralising Agents (D)	Fluoride application (E)	Fluoride application; Diet Counselling (F)	Fluoride application; Diet Counselling; Use of Remineralising Agents (G)	Fluoride application; Use of Remineralising Agents (H)	None (I)
10 to 15 years	0	0	0	0	0	0	0	1
5 to 10 years	2	0	0	3	1	0	0	0
Above 15 years	0	0	0	3	0	0	0	0
Below 5 years	16	1	2	34	2	1	1	1
Years in Practice	None; Use of Remineralising Agents (J)	Pit and Fissure Sealants (K)	Pit and Fissure Sealants; Diet Counselling (L)	Pit and Fissure Sealants; Use of Remineralising Agents (M)	Use of Remineralising Agents (N)	Use of Remineralising Agents; None (O)	None; Use of Remineralising Agents (P)	
10 to 15 years	0	1	0	0	0	0	0	
5 to 10 years	0	4	1	0	0	0	0	
Above 15 years	0	0	0	0	0	0	0	
Below 5 years	1	47	3	2	2	1	1	

Chi-square statistic ( $\chi^2$ ): 41.191 Degrees of freedom (dof): 45 Overall p-value: 0.634

### V. DISCUSSION:

The survey data on general dentists' knowledge, attitudes, and practices regarding preventive pedodontics in India offers a valuable perspective on the current landscape and highlights several key areas for discussion. The predominantly young age of respondents, with a mean age of 23.38 years, aligns with the broader trend of a relatively inexperienced workforce in the dental field. This youthful demographic may reflect a growing emphasis on preventive care as newer practitioners enter the field, yet it also raises concerns about the adequacy of experience in dealing with complex cases.

The high percentage of respondents with less than 5 years of practice experience indicates a relatively recent entry into the profession. This finding is consistent with other studies highlighting the influx of new dental graduates in India and the need for ongoing professional development. For

example, a study by Kaur et al. (2020)<sup>10</sup> found that new graduates often face challenges in translating theoretical knowledge into practical skills, emphasizing the need for robust continuing education programs. The low proportion of practitioners with more than 15 years of experience might suggest a possible gap in retaining experienced professionals or a shift in career trajectories.

Educational qualifications among respondents show a predominance of Bachelor of Dental Surgery (BDS) holders with fewer possessing a Master of Dental Surgery (MDS) degree. This distribution mirrors the broader educational landscape in India, where BDS is the standard entry-level qualification. A study by Kumar et al. (2021)[11] corroborates this trend, noting that while advanced degrees like MDS are becoming more common, they still represent a minority within the dental workforce.





Regarding caries prevention methods, the data reveals a strong preference for fluoridated toothpaste as the primary strategy, with less emphasis on diet counseling and other preventive measures. This preference is supported by research demonstrating the effectiveness of fluoride in caries prevention. For instance, a study by Marinho et al. (2013)[12] found that fluoride application significantly reduces the incidence of dental caries in children. However, the lower usage rates of diet counseling and remineralizing agents suggest that there may be gaps in integrating comprehensive preventive strategies into practice. This finding is consistent with studies like those by Gonsalves et al. (2022)[13], which indicate that while fluoride is widely recognized, other preventive methods are often underutilized.

The strong support for the feasibility of practicing preventive dentistry aligns with findings from similar studies. For example, a survey by Sharma et al. (2019)[14] found that a majority of dental practitioners in India believed in the effectiveness of preventive measures but faced practical challenges. These challenges, including difficulties in convincing patients and the time-consuming nature of procedures, are echoed in the literature. A study by Gupta et al. (2020)[15] highlighted that despite a general consensus on the importance of preventive care, practical barriers often hinder its implementation.

Familiarity with Silver Diamine Fluoride (SDF) among 66.20% of respondents is notable, but it also underscores a significant gap, as 33.80% are not familiar with this preventive measure. The increasing familiarity with SDF based on years in practice suggests that experience plays a crucial role in the adoption of newer preventive technologies. This finding is supported by research from Zhang et al. (2021)[16], which found that experienced practitioners are more likely to be aware of and utilize innovative preventive measures.

The variability in recommended fluoride concentration in children's toothpaste and preferences for treating white spot lesions highlights a lack of consensus in the field. For instance, while 41.78% of respondents recommend 300 ppm fluoride concentration, other studies, such as that by Tinanoff et al. (2019)[17], suggest that higher concentrations, such as 1000 ppm, may offer better protection against caries. Similarly, the diverse approaches to treating white spot lesions reflect ongoing debates about the most effective methods. Research by Hegde et al. (2021)[18] supports the use of remineralizing agents and resin

infiltration but also highlights the need for further evidence to standardize treatment protocols.

Inferential statistics reveal significant associations in several areas, including challenges in preventive dentistry, commonly used materials, and preferences for CPP-ACP agents. These associations provide insights into the practical aspects of implementing preventive care. However, the lack of a significant relationship between years in practice and the choice of caries prevention method suggests that other factors, such as continuing education or institutional guidelines, may play a more significant role in shaping preventive practices.

The study on general dentists' knowledge, attitudes, and practices regarding preventive pedodontics in India boasts several significant strengths. Its comprehensive sample size, encompassing diverse practice settings and experience levels, provides a broad perspective on preventive practices across the country. Detailed demographic analysis offers valuable context by revealing the age and experience of respondents, enriching the understanding of current practices. The study's inclusion of various preventive methods, such as fluoride application and CPP-ACP agents, presents a holistic view of the strategies employed by dentists. Moreover, the identification of practical challenges, like patient persuasion and procedural time demands, underscores areas needing targeted interventions. The robust use of inferential statistics enhances the reliability of the findings by uncovering significant patterns and associations. Additionally, the assessment of familiarity with emerging technologies, such as Silver Diamine Fluoride, highlights gaps in knowledge and opportunities for further education. By focusing on contemporary issues, the study provides relevant insights that can shape future dental education and practice. Overall, these strengths contribute to a nuanced understanding of preventive pedodontics and offer actionable implications for improving pediatric oral health care in Chennai.

The study on general dentists' knowledge, attitudes, and practices regarding preventive pedodontics in and around Chennai, while providing valuable insights, has several limitations. First, sampling bias may affect the generalizability of the findings if the sample was not randomly selected or if certain regions or practice types were underrepresented. The reliance on self-reported data introduces the risk of biases, as respondents may provide socially desirable answers or misrepresent their true practices and knowledge. Additionally, the cross-sectional design captures



only a snapshot in time, limiting the ability to assess changes over time or establish causality. The study's limited depth of analysis for specific methods and challenges could benefit from more detailed qualitative research. Variations in practice settings, such as urban versus rural or private versus public, might influence preventive measures but may not have been fully accounted for. Educational and regional differences within India could also impact practices, yet these variations were not addressed. Moreover, without information on response rates or non-respondents, the representativeness of the sample may be uncertain. Finally, inconsistencies in recommendations for fluoride concentrations and preventive methods highlight a lack of consensus, indicating a need for standardized protocols. Recognizing these limitations is crucial for accurately interpreting the findings and guiding future research in preventive pedodontics.

The findings from the study on general dentists' knowledge, attitudes, and practices regarding preventive pedodontics in India underscore several key implications for future research, education, and clinical practice. To address gaps in knowledge about emerging technologies like Silver Diamine Fluoride (SDF) and CPP-ACP agents, educational programs should offer comprehensive training on these advancements. Standardization of protocols is crucial to unify practices and ensure high-quality care, particularly given the variability in fluoride recommendations. Additionally, overcoming challenges such as patient persuasion and time constraints requires more effective communication strategies and efficient preventive interventions. Longitudinal studies could provide insights into how preventive practices evolve and their long-term impact. Research should also account for regional and practice setting differences to tailor interventions appropriately. Improving data collection methods by incorporating objective measures alongside self-reports can enhance data reliability. Furthermore, the study's findings can inform policy development and advocacy to integrate preventive care into national health policies. Lastly, continued professional development through workshops and seminars will help practitioners stay abreast of new developments in preventive pedodontics. Addressing these implications can significantly enhance preventive care practices and improve pediatric oral health outcomes in and around Chennai.

## VI. CONCLUSION:

In conclusion, the study on general dentists' knowledge, attitudes, and practices regarding preventive pedodontics in and around Chennai provides a crucial overview of the current landscape and highlights several areas for improvement. While the majority of dentists demonstrate a supportive attitude towards preventive care, significant gaps in knowledge about newer technologies and variability in practices suggest the need for enhanced educational programs and standardized protocols. Addressing practical challenges and regional differences, improving data collection methods, and advocating for policy changes are essential steps towards optimizing preventive care. By focusing on these areas, stakeholders can better support general dentists, ultimately contributing to more effective and consistent pediatric oral health care across Chennai.

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