

ABSTRACT

Fluoride remains a cornerstone of caries prevention in pediatric dentistry, with well-established evidence supporting its safety and effectiveness. Professional organizations, including the American Academy of Pediatric Dentistry (AAPD), have developed guidelines to standardize fluoride use across clinical and educational settings. Despite this, variability persists in how providers obtain fluoride-related information, interpret recommendations, and apply them in practice. Additionally, increasing public skepticism and caregiver concerns regarding fluoride exposure present ongoing challenges for pediatric dental providers.

Differences in training environments, years of experience, and access to information sources may influence provider knowledge, confidence, and clinical decision-making. Emerging information platforms, such as social media and artificial intelligence tools, further shape the evolving landscape of professional education. However, limited research has examined how pediatric dental providers and residency program directors access fluoride-related information and how these sources influence perspectives and practices.

This study aims to assess where pediatric dental providers and program directors obtain information regarding fluoride, evaluate their current perspectives, and examine how these views are integrated into clinical care and academic instruction. Understanding these factors is essential to identify knowledge gaps, address barriers to fluoride acceptance, and inform future educational strategies in pediatric dentistry.

METHODS AND MATERIALS

A cross-sectional, anonymous electronic survey was distributed to pediatric dental providers, including residents, practicing dentists, faculty, and program directors. The survey collected data on demographics, sources of fluoride information, perspectives on fluoride use, and clinical and educational practices. Only completed surveys were included in the analysis.

Descriptive statistics were used to summarize responses. Chi-square (χ^2) tests assessed differences in information sources and clinical behaviors across provider roles, and independent t-tests compared perspective scores. Likert-scale responses assessing fluoride-related attitudes were coded on a 5-point scale (1 = strongly disagree to 5 = strongly agree) and summarized using mean values. Differences in fluoride use across years of experience were analyzed using chi-square testing. A p-value of < 0.05 was considered statistically significant.

RESULTS

A total of 267 complete responses were analyzed, with practicing pediatric dentists representing the largest group. Fluoride use was nearly universal across all roles ($>93\%$), with no significant association between years of experience and fluoride use ($p = 0.354$).

Fluoride varnish was the most commonly utilized treatment across all provider roles. Use of silver diamine fluoride (SDF) and glass ionomer restorations varied significantly by role ($p < 0.01$), with higher utilization reported by program directors. AAPD guidelines were the most frequently cited information source ($>95\%$). Program directors were significantly more likely to rely on peer-reviewed journals and public health resources ($p < 0.01$).

Attitudes toward fluoride were consistently positive, with strong agreement regarding efficacy and safety. Program directors demonstrated the highest confidence and lowest concern, while residents showed greater variability in responses. Fluoride was widely integrated into both practice and education; however, program directors reported significantly greater incorporation into curricula and more frequent updates to clinical practices ($p < 0.01$).

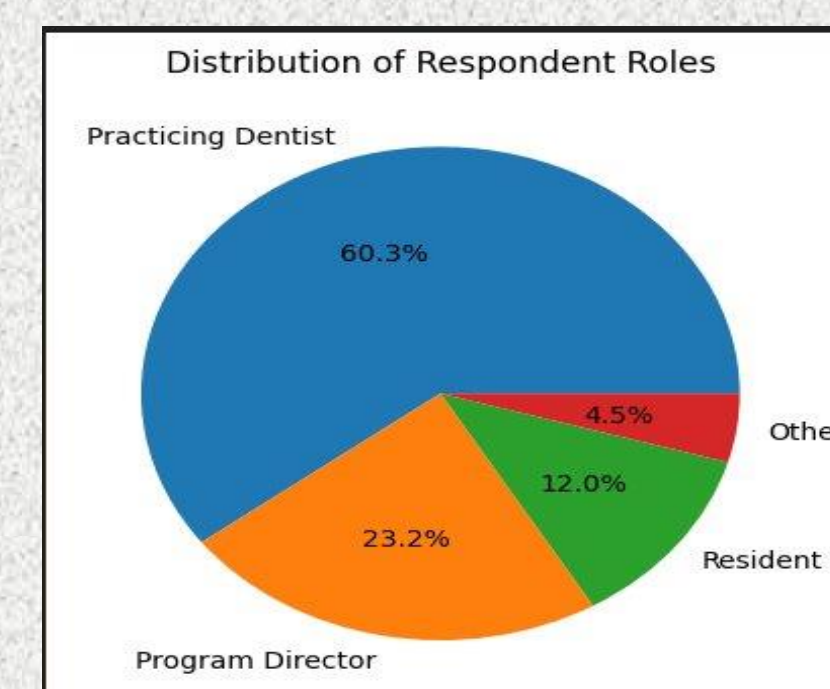


Fig. 1

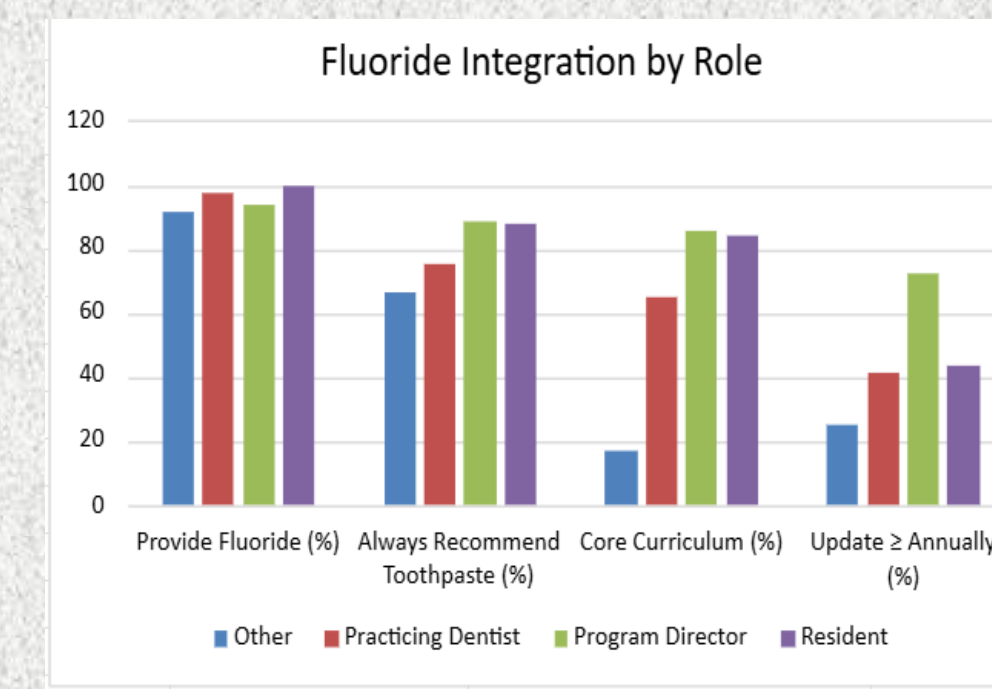


Fig. 2

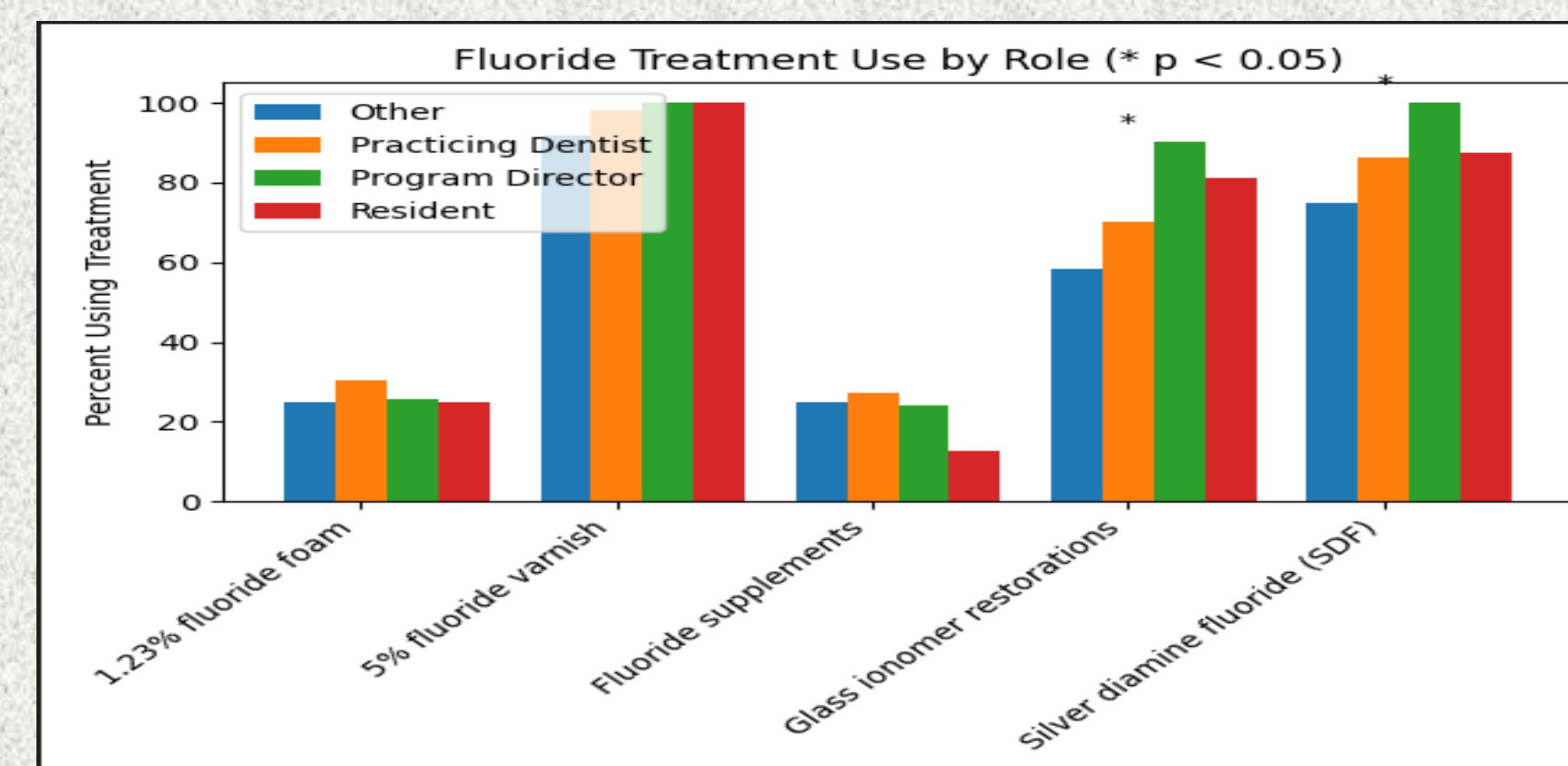


Fig. 3

Figure 1–3. Grouped bar charts demonstrating fluoride treatment utilization by provider role. Significant differences were observed for silver diamine fluoride and glass ionomer restorations (* $p < 0.05$), while other treatments showed consistent use across roles.

RESULTS (cont.)

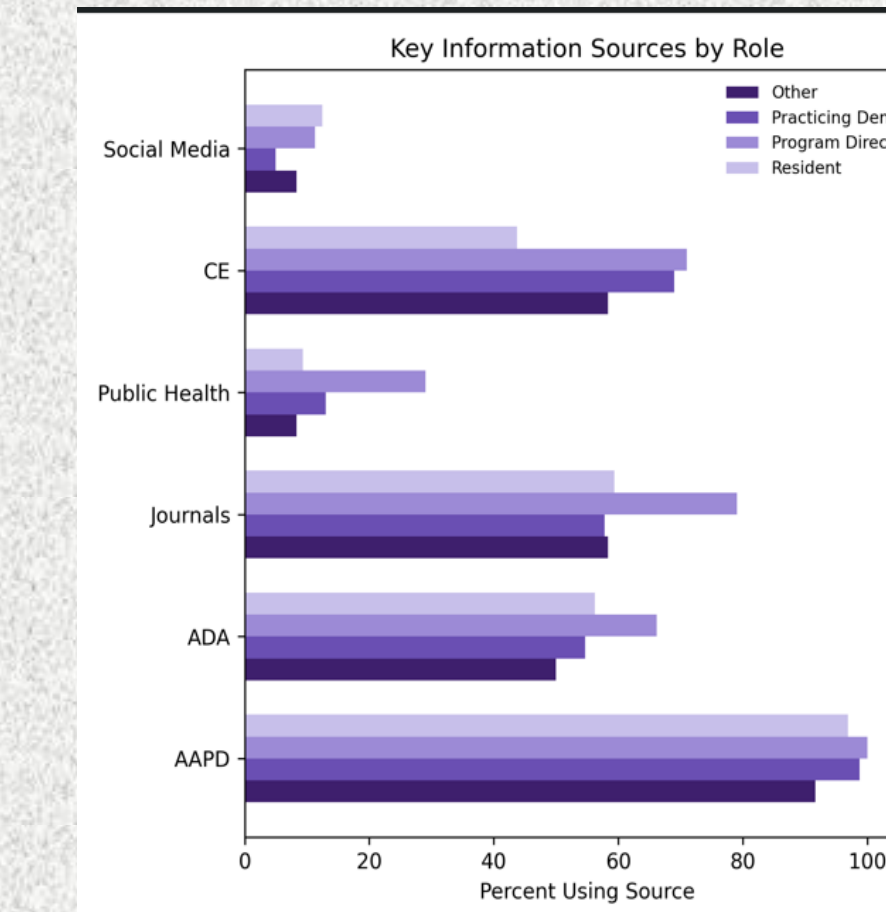


Fig. 4

Fluoride Attitudes by Provider Role

Role	Evidence Confidence	Concern Level
Program Director	Highest	Lowest
Faculty	High	Low
Practicing Dentist	Moderate	Moderate
Resident	Variable	Higher variability

Fig. 5

Figure 4–5. Summary of fluoride attitudes by provider role. Evidence confidence and concern levels are categorized based on mean Likert-scale responses. Program directors exhibit the highest confidence and lowest concern, whereas residents demonstrate greater variability.

CONCLUSIONS

- Fluoride use is nearly universal ($>93\%$) across all provider roles, with no association with years of experience
- Fluoride varnish remains the standard of care, with consistent use across all groups
- Silver diamine fluoride and glass ionomer use vary by role, with greater adoption among program directors
- AAPD guidelines are the primary information source across all roles ($>95\%$)
- Program directors rely more heavily on peer-reviewed journals and public health resources, reflecting stronger engagement with high-level evidence
- Attitudes toward fluoride are uniformly positive, with strong agreement regarding efficacy and safety
- Program directors demonstrate the highest confidence and lowest concern, while residents exhibit greater variability
- Fluoride is consistently integrated into clinical practice, though educational integration and practice updates vary by role
- Program directors lead curriculum integration and practice updates, reflecting their role in shaping evidence-based standards

REFERENCES

- Antonioni MB, et al. Pediatric Dentists' Silver Diamine Fluoride Education, Knowledge, Attitudes, and Professional Behavior: A National Survey. *Journal of Dental Education*. 2019;83(2).
- Chi DL. Parent Refusal of Topical Fluoride for Their Children: Clinical Strategies and Future Research Priorities. *Dental Clinics of North America*. 2017;61(3):607–617.
- Crystal YO, et al. Use of Silver Diamine Fluoride for Dental Caries Management in Children and Adolescents. *Pediatric Dentistry*. 2017;39(5):E135–E145.
- Donly KJ, Baez RA. Fluoride Varnish: Use for Caries Prevention. *Journal of the American Dental Association*. 2000;131:1145–1146.
- Featherstone JD. Prevention and Reversal of Dental Caries: Role of Low-Level Fluoride. *Community Dentistry and Oral Epidemiology*. 1999;27(1):31–40.
- Kumar A, et al. A Survey of Caregiver Acculturation and Acceptance of Silver Diamine Fluoride Treatment for Childhood Caries. *BMC Oral Health*. 2019;19:228.
- Nelson T, et al. Silver Diamine Fluoride in Pediatric Dentistry Training Programs. *Pediatric Dentistry*. 2016;38(3):212–217.
- O'Mullane DM, et al. Fluoride and Oral Health. *Community Dental Health*. 2016;33(2):69–99.
- Patel MK, et al. Acceptance and Awareness of Fluoride-Free Toothpastes Among Pediatric Dentists. *Journal of Clinical Pediatric Dentistry*. 2023;47(5):73–80.
- Weyant RJ, et al. Topical Fluoride for Caries Prevention: Executive Summary. *Journal of the American Dental Association*. 2013;144(11):1279–1291.
- American Academy of Pediatric Dentistry. Policy on Use of Fluoride. *Reference Manual of Pediatric Dentistry*. 2024:101–103.