



Project USAP 2024: Use of Sedative Agents in Pediatric Dentistry- 39-Years & Counting

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INTRODUCTION

Conscious sedation in pediatric dentistry is a complex and highly specialized procedure that requires clinical expertise, precise judgment, and a deep understanding of both patient and pharmacologic factors. The goal is to safely alter a child’s behavior to facilitate quality dental care while maintaining protective reflexes and airway control. According to the widely accepted definition, sedation is a medically induced, depressed state of consciousness in which patients can independently maintain a patent airway and respond appropriately to physical or verbal commands.

To administer sedation safely, providers must be well trained in pre-sedation evaluation, airway assessment, fasting protocols, pharmacodynamics and pharmacokinetics of sedatives, intraoperative monitoring, and post-operative discharge criteria. In addition, providers must be adequately trained and prepared to support the sedation process and manage potential complications. A wide margin of safety is essential to minimize the risk of unintentional loss of consciousness. Project USAP (1985–2024) provides a longitudinal look at how sedation practices in pediatric dentistry have evolved across the United States. Originally started in 1985, Project USAP was developed to systematically evaluate and monitor sedation practices across pediatric dental settings in the United States. Now, 39 years later, the continuation of this longitudinal study provides a unique and valuable lens through which to analyze evolving sedation trends, safety outcomes, and clinical standards in pediatric dentistry. The extended timeline of this study allows for meaningful comparisons across decades, helping to inform best practices and shape the future of pediatric sedation protocols.

This study outlines the importance of continued training, safety protocols, and individualized care. Ongoing assessment and evidence-based guidelines will remain critical to supporting safe and effective sedation practices in pediatric dentistry.

MEMORIAM

In memoriam of the late Milton Houpt, DDS, who spearheaded the first Project USAP in 1985, we honor his pioneering contributions to dentistry and research. Dr. Houpt’s leadership in improving dental care access and advancing research in pediatric dentistry left a lasting impact on the profession.

METHODS

The study design is a cross-sectional study which consisted of a 26-item questionnaire sent out via email to members of the AAPD including residents, practicing dentists, academics etc. It was hosted by SurveyMonkey to meet security standards for the transmission of online data. Transport layer security protocol was used to encrypt and transmit data which are frequently backed up in an encrypted storage. To ensure anonymous responses, no IP addresses were collected. The statistical analysis plan included an independent logistic regression analysis. Frequencies for each of the 26 questions were collected and summarized into relevant graphs and tables. Cross tabulation and statistical significance were calculated to analyze each objective individually.

RESULTS

Table 1: Participants in Project USAP (1985 – 2024)

Year:	1985	1991	1995	2000	2010	2024
Total Number of Respondents:	1,105	1,497	1,676	1,778	1,642	473
Response Rate (%):	54	59	62	54	44	5.5
Type of Training:						
Grandfathered	9	3	2	2	0	0.2
University-based	47	47	58	23	17	9.4
Hospital Based	31	40	40	27	30	35.3
Combined	13	10	-	48	53	54.9
Area of Practice:						
Northeast	-	-	-	-	-	17
Southeast	-	-	-	-	-	20
North Central	-	-	-	-	-	13
Southwestern	-	-	-	-	-	22
Western	-	-	-	-	-	28
Years of Practice:						
1-5 years	18	19	20	19	23	21
6-10 years	30	19	15	15	17	17
11-15 years	23	24	18	13	14	10
16-20 years	10	19	19	15	10	26
20+ years	19	19	28	39	36	17
Diplomate Status						
Diplomate	19	34	35	35	58	77
Non-diplomate	81	66	65	65	42	15

* Numbers in this section are percentages

Fig. 2a: Percent of Patients Receiving N₂O and Sedative Agents Combined (2024)

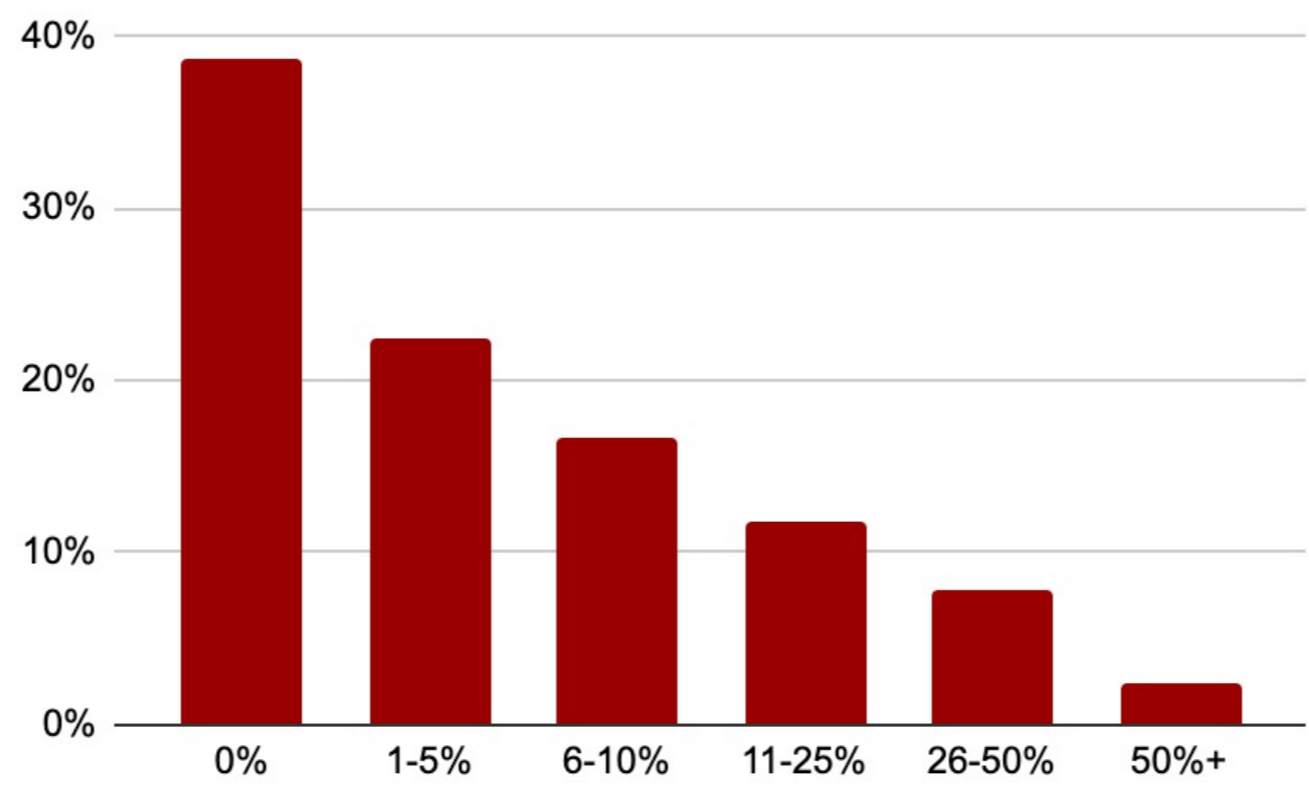


Fig. 3: Trends in Reported Changes in the Use of Sedative Agents (1991-2024)

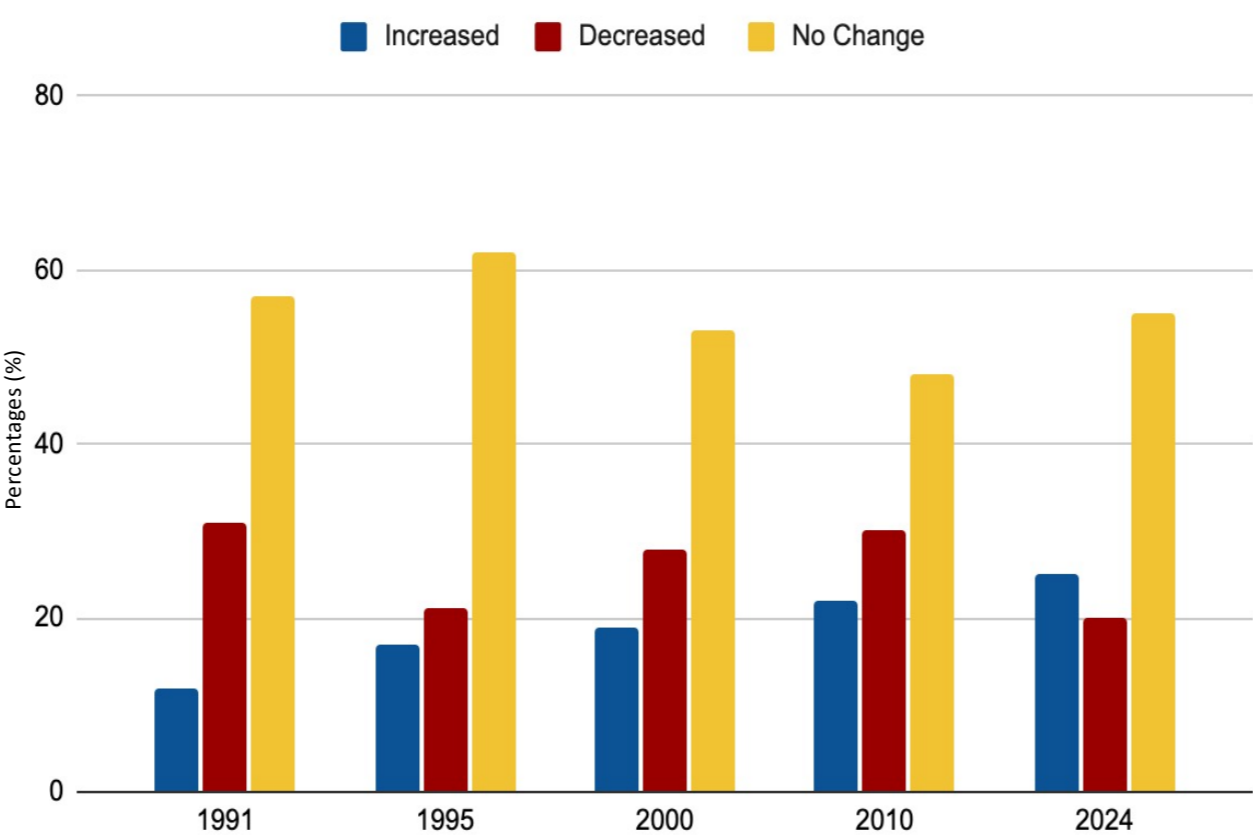


Fig. 1: Most Commonly Reported Sedative Agent Combinations Used in Practice (2024)

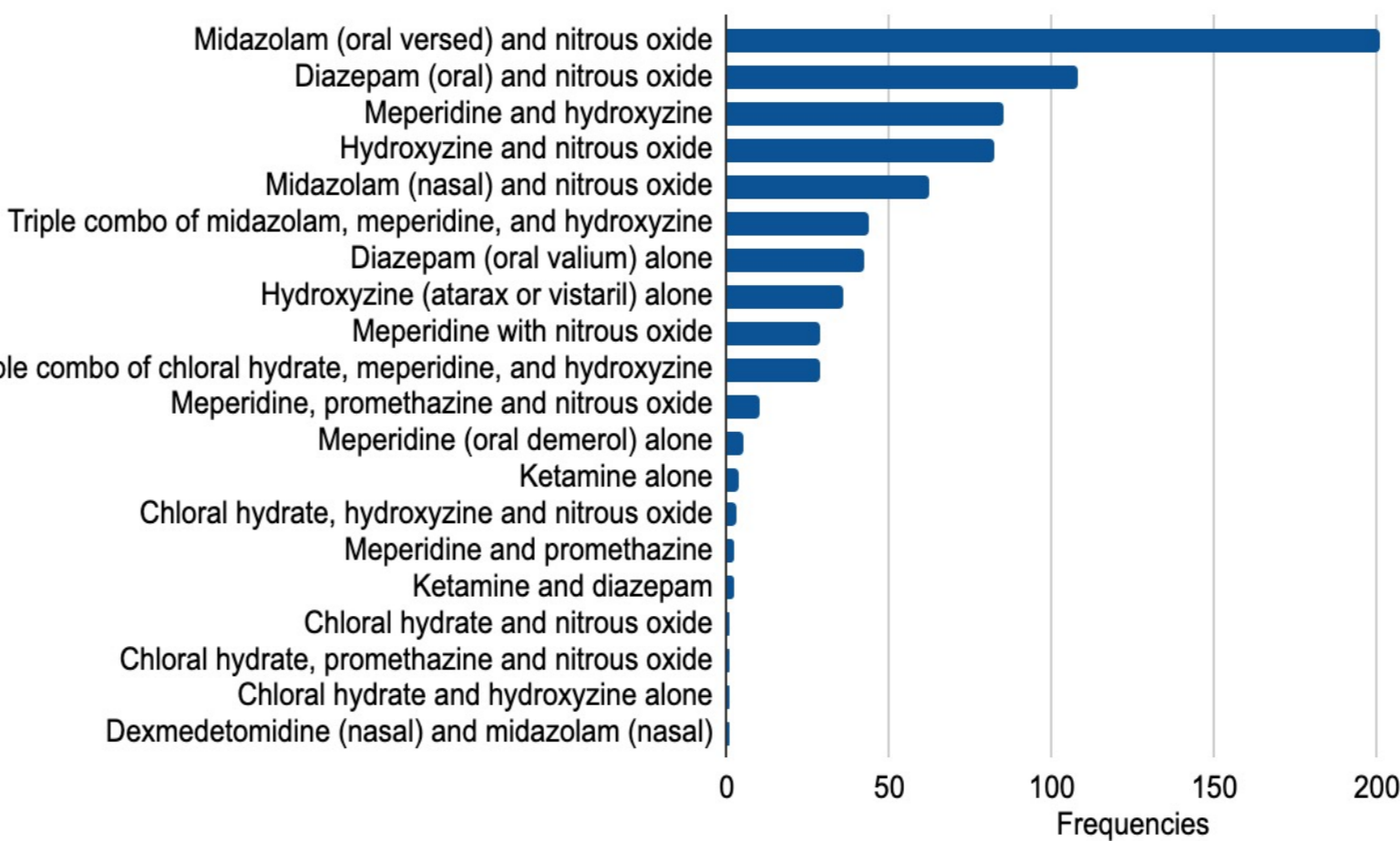


Fig. 2b: Participants Who do NOT Use Sedative Agents Other Than N₂O per US Region

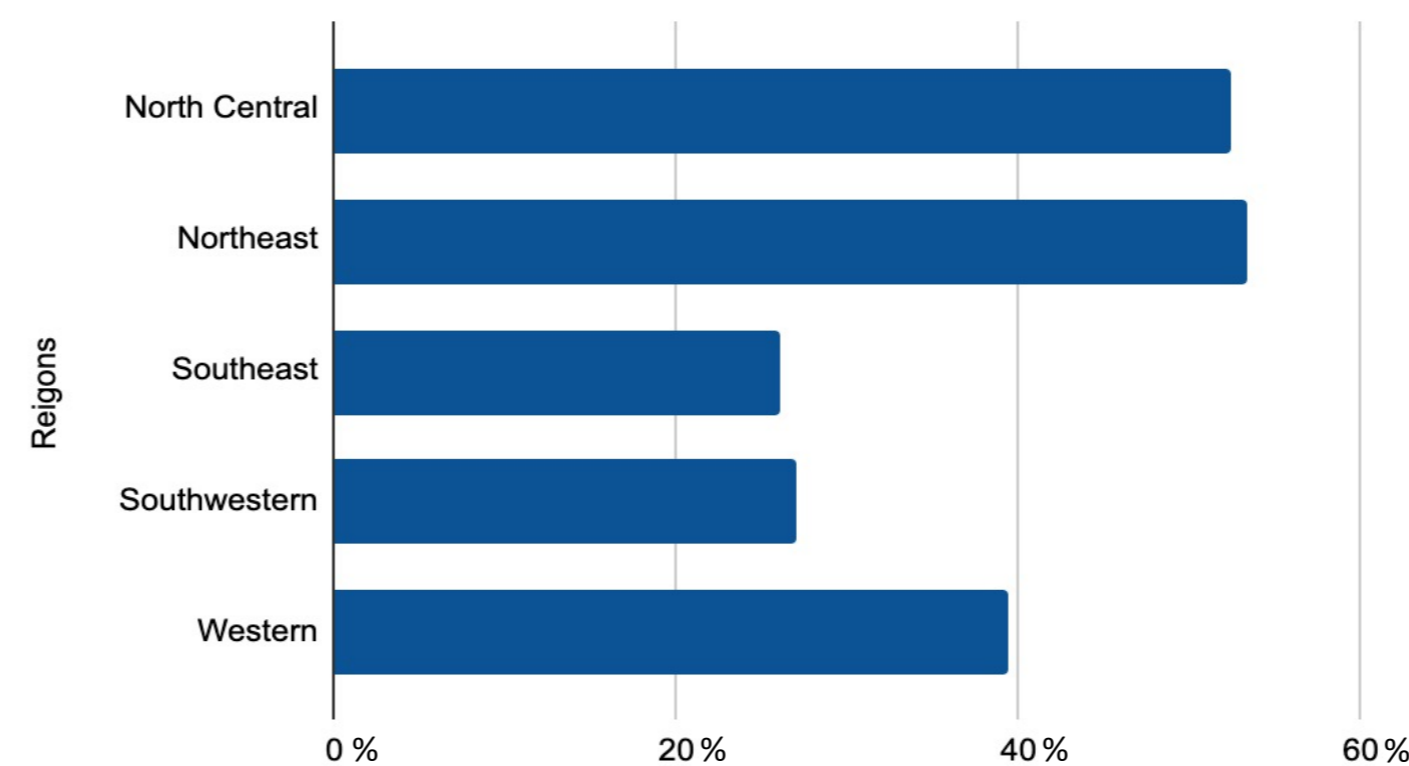


Fig. 4: Trends in Mode of Administration (2000-2024)

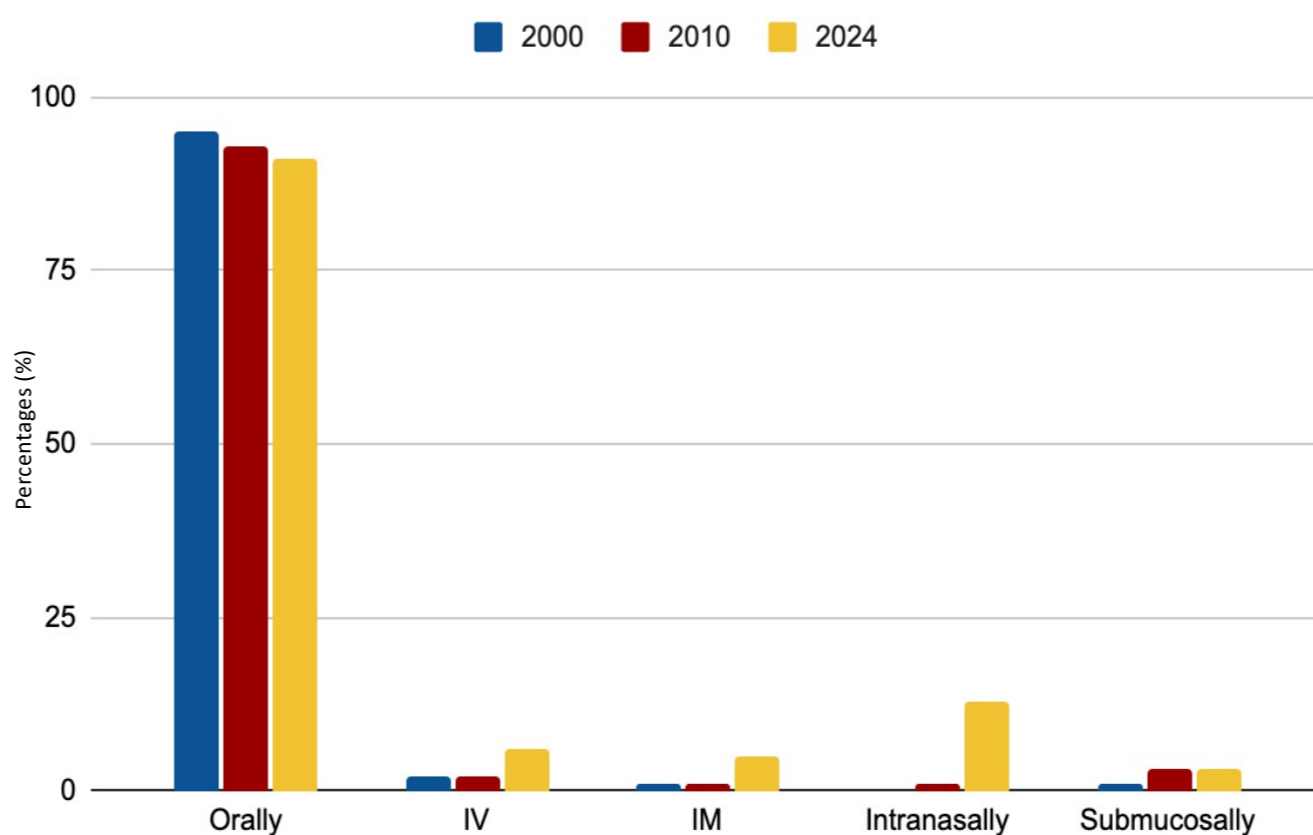


Fig. 5a: Reasons for Increased Use (2024)

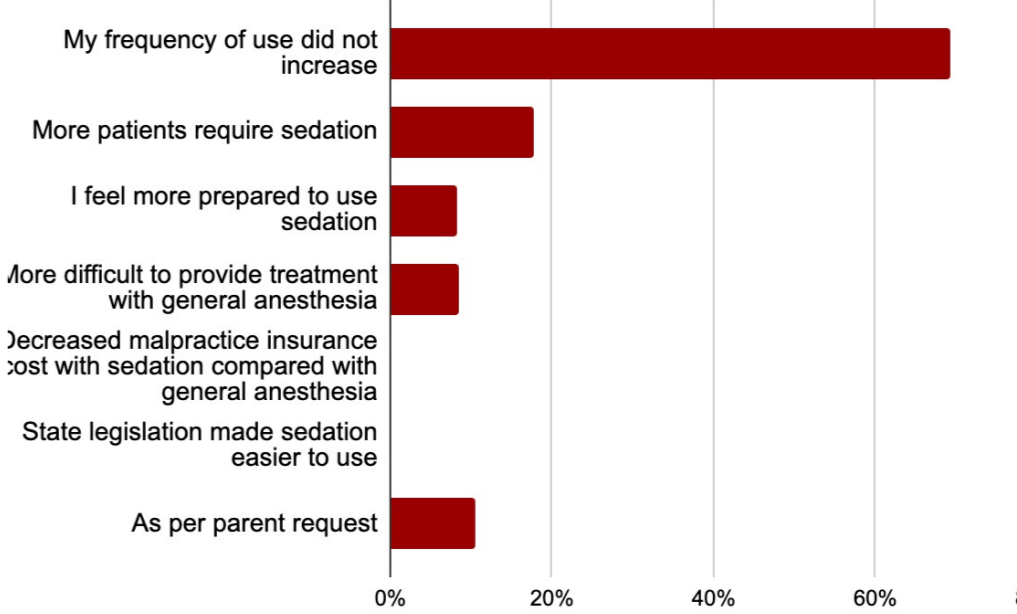
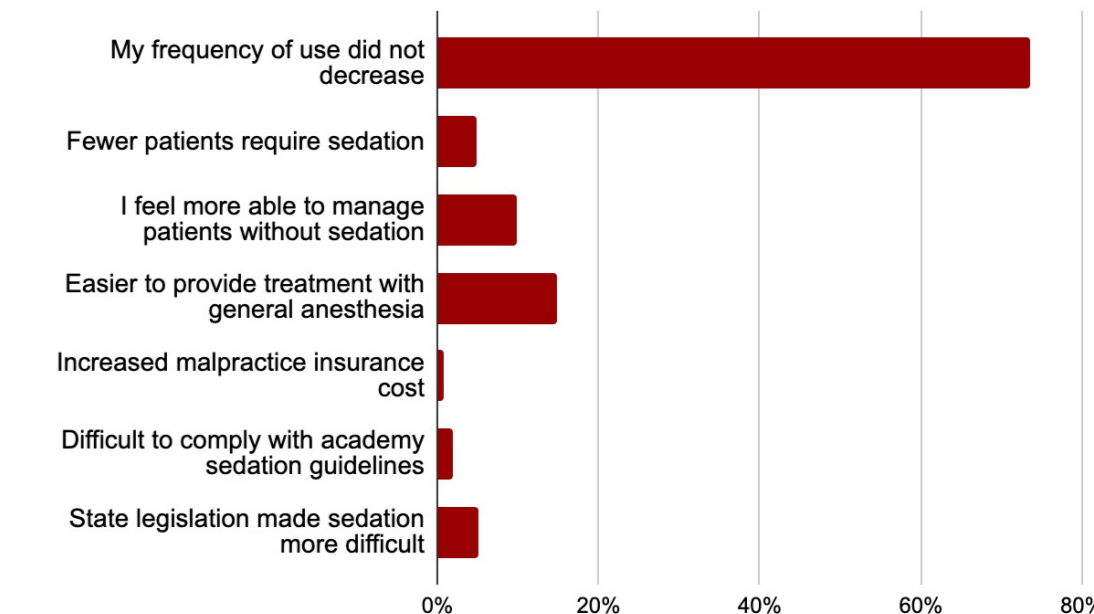


Fig. 5b: Reasons for Decreased Use (2024)



DISCUSSION & CONCLUSIONS

This longitudinal analysis of Project USAP data from 1985 to 2024 reveals significant trends in the use of sedation practices among pediatric dental providers. The characteristics of respondents have changed over time, with a notable rise in providers trained in university-based or combined settings. By 2024, most respondents held diplomate status, suggesting a growing professional standardization in pediatric dentistry. In 2024, nearly 40% reported not using this combination in any of their patients, and over 60% used it in fewer than 10% of cases. Only a small minority (3%) reported using it with more than half of their patients (Fig. 2a). These findings suggest a cautious or selective approach to combining N₂O and sedative agents in pediatric dental care. This suggests a cautious and selective approach to sedation, likely influenced by regulatory, parental, and patient-centered considerations. Usage patterns varied by region, the North Central and Northeast reported the highest percentages of providers not using sedative agents beyond N₂O. Providers in the Southeast and Southwest were more likely to use sedative agents other than N₂O (Fig. 2b). This may reflect localized regulations, training preferences, or philosophical approaches to pediatric care. Additionally, trends from 1991 to 2024 (Fig. 3) show that most pediatric dentists reported stable use of sedative agents. However, the percentage reporting increased use has grown steadily, while those reporting decreases have declined, thus indicating a gradual shift toward more frequent use. The most cited reasons for increased sedation use included more patients requiring sedation and providers being better prepared (Fig. 5a). Conversely, decreased use was often due to reduced patient need, regulatory barriers, and institutional restrictions (Fig. 5b). Despite these trends, a large portion of respondents reported no significant change in their use over time. Oral administration remained the dominant route (Fig. 4), though minor increases in intranasal and IV methods were noted in 2024. This could potentially reflect a wider scope of training. Midazolam (oral) combined with N₂O was the most frequently used combination in 2024 (Fig. 1), followed by various combinations involving hydroxyzine, ketamine, and dexmedetomidine. This points toward a preference for agents with favorable safety profiles and manageable side effects in pediatric populations. Overall, sedation practices appear to be stabilizing, with increased emphasis on training, safety, and individualized care. Continued monitoring and evidence-based guidance will support optimal patient outcomes.



REFERENCES/SURVEY

