

Artificial Intelligence in Pediatric Dentistry: A National Survey on Perceptions, Applications, and Adoption

Han Z, Shruti J, Swee M, Loo CY (Tufts University School of Dental Medicine, Boston, MA)

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Introduction

Artificial intelligence (AI) is increasingly being integrated into healthcare and dentistry, with applications that may improve diagnostic accuracy, efficiency, and clinical decision-making. In dentistry, AI has been described as both a promising tool and a disruptive innovation, with prior reviews highlighting its growing use across imaging, diagnosis, treatment planning, and workflow optimization. Recent literature has also suggested that AI may have emerging applications in pediatric dentistry, including prediction of child behavior and support for clinical decision-making. However, despite increasing interest in AI across medicine and dentistry, little is known about how pediatric dentists specifically perceive these technologies or the extent to which they are currently being used in pediatric practice.

Survey-based studies in broader healthcare populations have shown that clinician adoption of AI is influenced not only by awareness and access, but also by perceived usefulness, trust, training, and concerns related to privacy, risk, and dehumanization of care. Because pediatric dentists care for children who may present with unique behavioral, developmental, and communication needs, understanding specialty-specific perspectives is especially important. Identifying current knowledge, use patterns, perceived benefits, and barriers to adoption may help guide future education, policy, and responsible integration of AI into pediatric dental care. To address this gap, the present study surveyed licensed pediatric dentists in the United States regarding their familiarity with AI, current and intended use, perceived value, and concerns about implementation in clinical practice.

Objective

To assess pediatric dentists' knowledge, current use, perceived benefits, and barriers to adopting artificial intelligence (AI) in clinical practice across the United States, and to identify factors associated with willingness to incorporate AI into diagnosis, treatment planning, and behavior management.

Methods

- Cross-sectional, anonymous survey of licensed U.S. pediatric dentists
- Survey underwent **face and content validity testing** before distribution
- Distributed through the **AAPD listserv** via **Qualtrics**
- Included **multiple-choice, yes/no, and Likert-scale** items
- Assessed: demographics, AI familiarity, current AI use, future AI use, perceived benefits, barriers to adoption
- **Descriptive statistics** summarized responses
- **Chi-square** or **Fisher's exact tests** evaluated associations
- Analyses performed in **SAS 9.4**

Results

Table 1: Subject Demographics

Characteristic	n (%)
Gender	
Male	80 (47.9)
Female	87 (52.1)
Ethnicity	
Hispanic	18 (10.8)
Non-Hispanic	148 (89.2)
Race	
White	119 (70.8)
Black or African American	7 (4.2)
Asian	28 (16.7)
American Indian or Alaska Native	1 (0.6)
Prefer not to say	13 (7.7)
Age	
<30 years	5 (3.0)
30–39 years	35 (20.7)
40–49 years	46 (27.2)
>50 years	83 (49.1)
Years in practice (after residency)	
1–5 years	31 (18.3)
6–10 years	21 (12.4)
11–15 years	22 (13.0)
16–20 years	19 (11.2)
20+ years	76 (45.0)
Primary practice setting	
Private practice (solo)	44 (26.0)
Private practice (group)	78 (46.2)
Dental Service Organization (DSO)	14 (8.3)
Academic institution	17 (10.1)
Community Health Center / FQHC	12 (7.1)
Other	4 (2.4)
Practice location	
Urban	56 (33.1)
Suburban	101 (59.8)
Rural	12 (7.1)
Formal AI training / continuing education	
Yes	38 (22.6)
No	127 (75.6)
Not sure	3 (1.8)

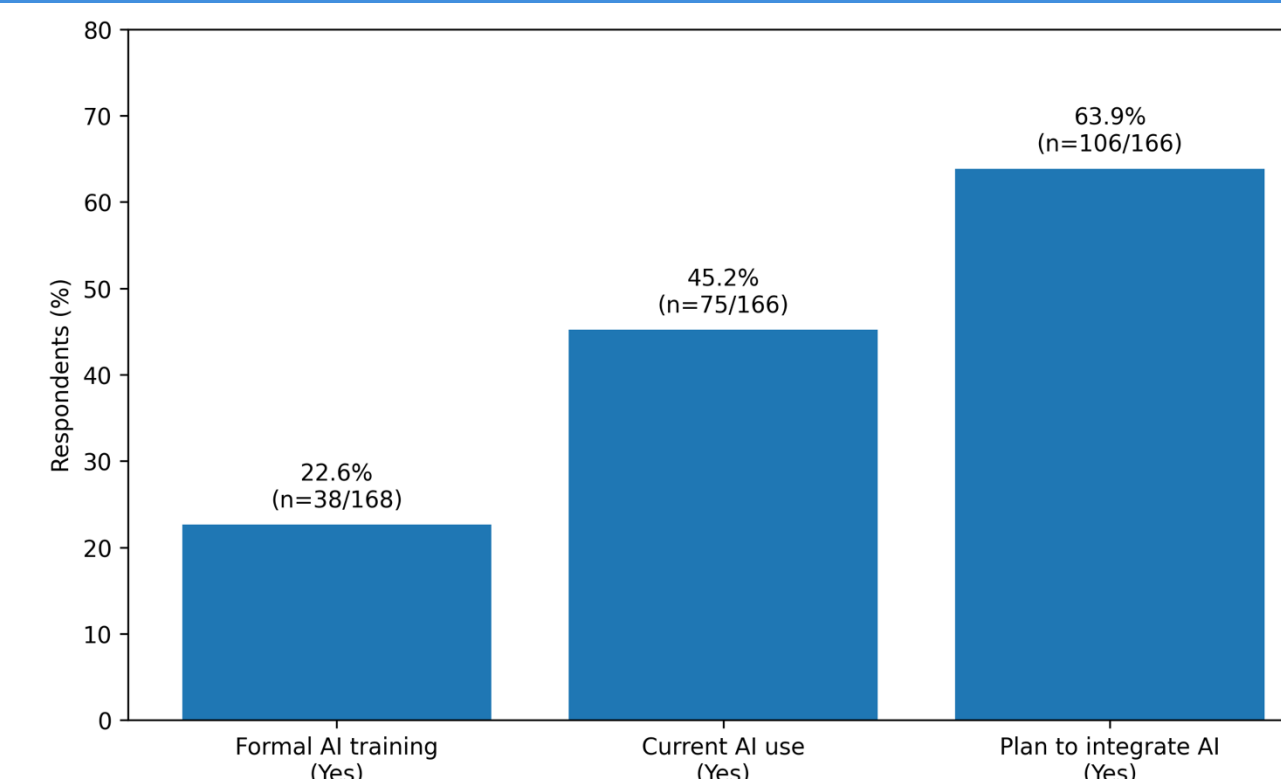


Figure 1. AI Familiarity and Adoption Among Pediatric Dentists. Percentages reflect "Yes" responses. Totals vary slightly by item due to missing responses.

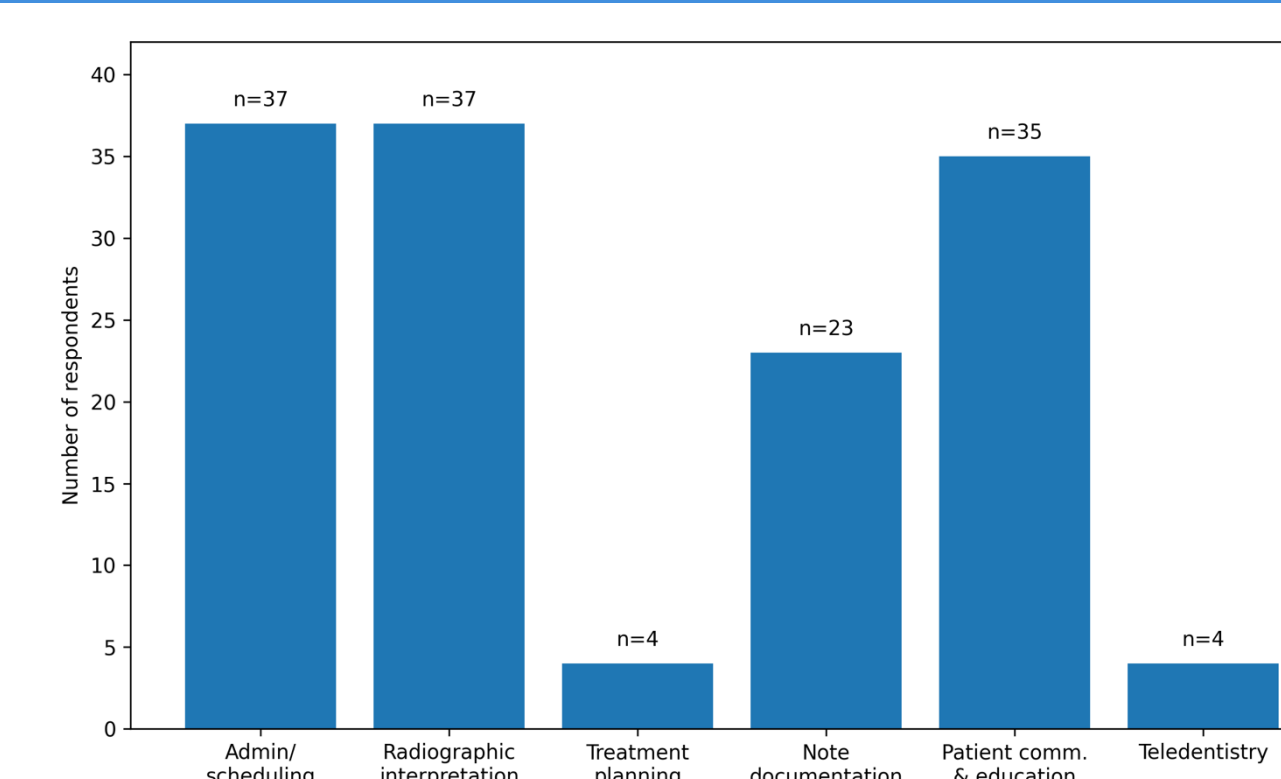


Figure 2. Types of AI Tools Currently Used. Multiple responses allowed. Counts reflect respondents who reported current AI use.

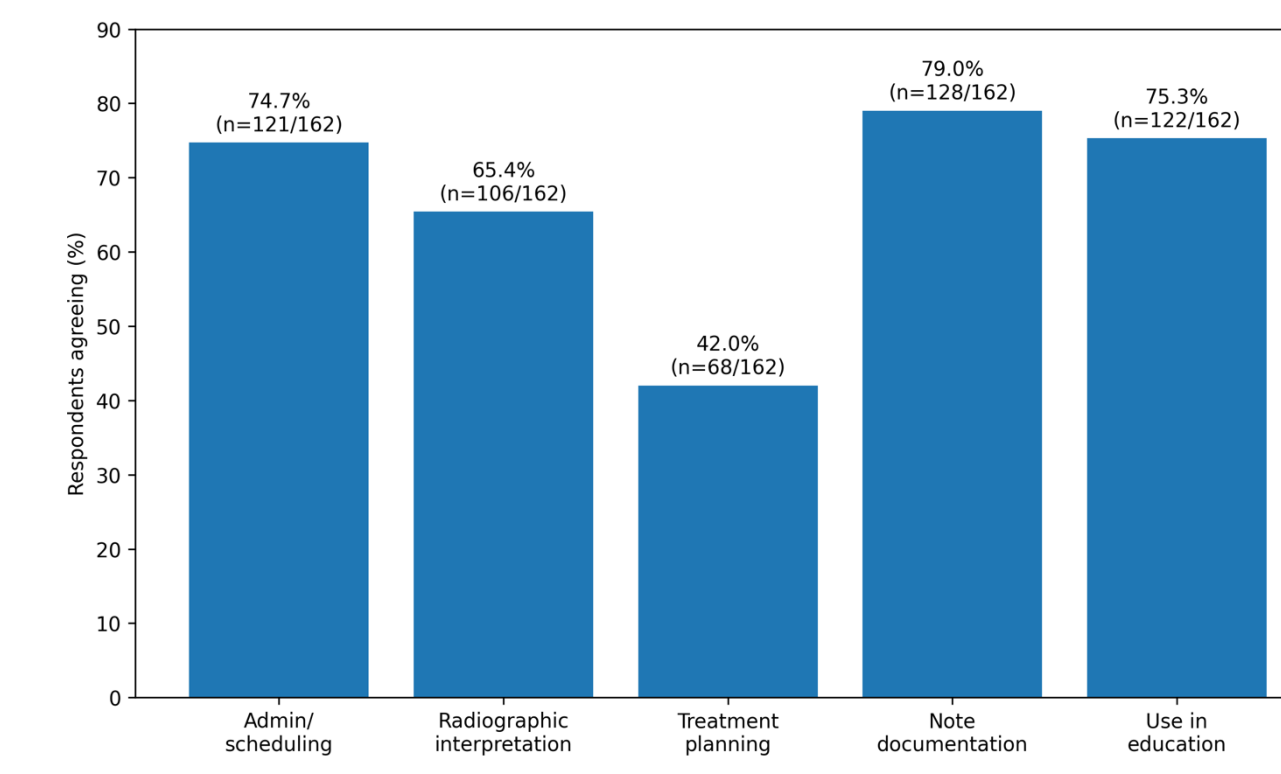


Figure 3. Perceived Benefits of AI. Agreement = somewhat agree + strongly agree. Totals vary slightly due to missing responses.

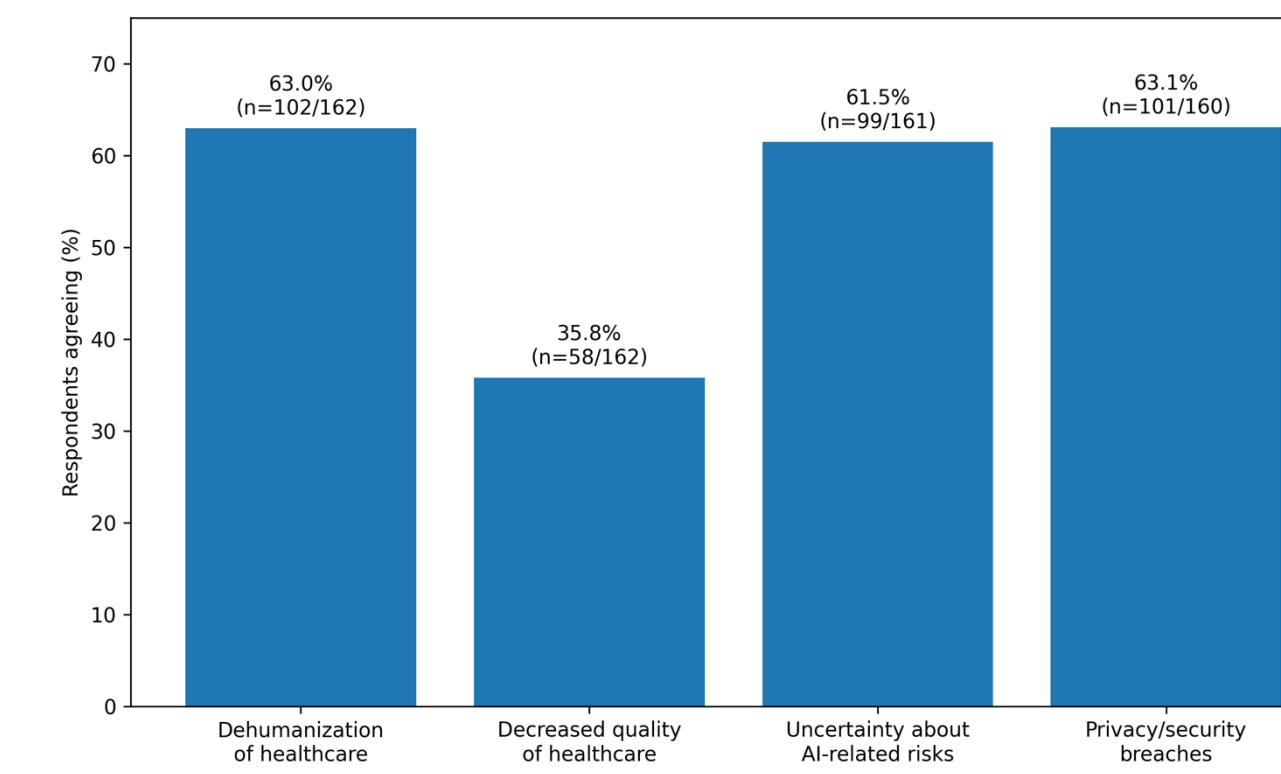


Figure 4. Perceived Concerns About AI. Agreement = somewhat agree + strongly agree. Totals vary slightly due to missing responses.

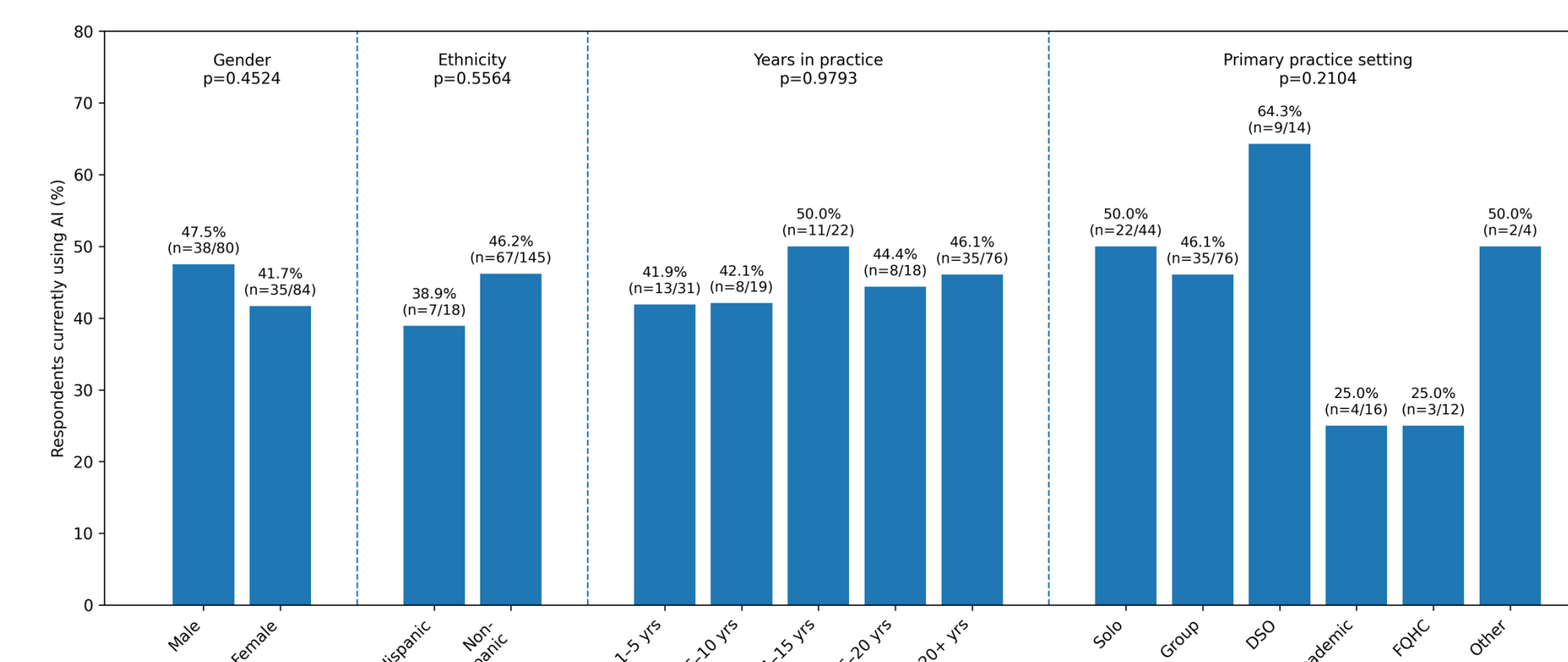


Figure 5. Current AI Use Across Demographic Groups. Outcome shown is "Yes" to currently using AI in the office (83). No statistically significant associations were observed for gender, ethnicity, years in practice, or primary practice setting.

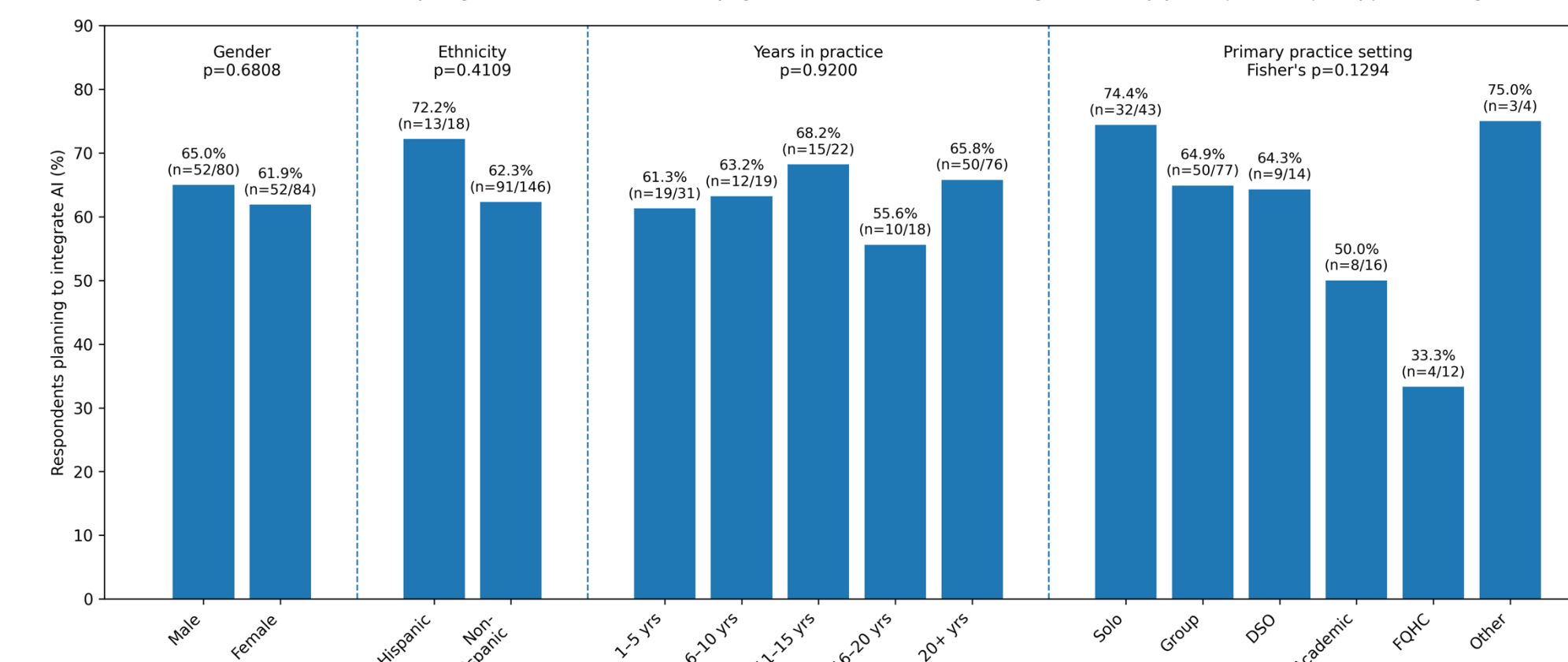


Figure 6. Willingness to Integrate AI Across Demographic Groups. Outcome shown is "Yes" to planning to integrate AI (104). No statistically significant associations were observed for gender, ethnicity, years in practice, or primary practice setting.

Results (Continued)

- **167 respondents** completed the survey
- Only **22.6%** reported formal AI training
- **45.2%** currently used AI in practice
- **63.9%** planned to integrate AI into practice
- Most common AI applications: Administrative/scheduling tasks, radiographic interpretation, patient communication/education
- Most strongly endorsed benefits: Documentation, education, workflow efficiency
- Leading concerns: privacy/security, dehumanization, uncertainty about AI-related risks
- No significant associations were found between demographic variables and: Current AI use and willingness to integrate AI

Conclusion

- Pediatric dentists showed **generally positive attitudes** toward AI
- **Future willingness to adopt AI exceeded current use**
- AI was viewed most favorably for: documentation, education, workflow efficiency
- Main barriers to adoption included: privacy/security concerns, dehumanization of care, uncertainty about AI-related risks
- Demographic variables were **not significantly associated** with current AI use or willingness to integrate AI
- Findings support the need for: targeted AI education, specialty-specific training, thoughtful implementation in pediatric dentistry

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