

# Utilization of Intraoral Scanners for Fabrication of Obturators for Patients Born with Cleft Lip/ Palate

Swara Fadnis<sup>1</sup>, Bhavna Shroff<sup>2</sup>, Jayakumar Jayaraman<sup>3</sup>, Caroline Carrico<sup>4</sup>, Tiffany Williams<sup>5</sup>

Department of Pediatric Dentistry, Virginia Commonwealth University

twilliams25@vcu.edu



## Purpose

- To assess the knowledge and attitude of providers regarding incorporating a digital scanner for impression taking in children born with cleft lip and/or palate.
- To determine whether providers incorporate digital scanning in their practices
- To assess what the provider's experience has been with digital scanning, if they use it in practice
- To assess what reservations practitioners have, if any, regarding incorporating this technology into their everyday practice

## Background

- Cleft lip and/or palate (CLP) is one of the most common congenital defects involving the orofacial region.
- According to the Centers for Disease Control and Prevention, about 1 in 600 babies are born with a cleft lip with cleft palate in the United States.
- In a cleft condition, there is a communication between the oral cavity and the nasal cavity. This lack of barrier leads to nasal regurgitation and feeding problems that could lead to malnourishment of the child and failure to thrive.
- The impact of physical deformities because of CLP can have long term detrimental effects to the patient's growth and development as well as on the developing psyche.
- Digital intra-oral (IO) scanners were first introduced in dentistry in the 1980s. Since then, advancements in dental technologies have popularized the use of these devices for fabrication of dentures, orthodontic appliances, and crowns.
- IO scanners have major advantages over conventional impressions, such as:
  - Efficiency in Time and Resources
  - Safety
  - Patient Preference
  - Accuracy, Reproducibility, and Longevity of Impressions
  - Reduction in Waste
  - Patient Education Tool

## Methods

- A survey was sent out to members of the American Association of Pediatric Dentistry (AAPD).
- The survey included questions regarding the providers' perception of incorporating digital intraoral scanners for impressions for fabrication of obturators.
- The survey also included questions about the providers' reservations in using this technology in practice, what their experience has been with the incorporation of this technology into practice, and what is the reason, if any, for not utilizing this technology for this purpose.
- This study was approved for distribution by Virginia Commonwealth University Institutional Review Board (ID: HM20023815).

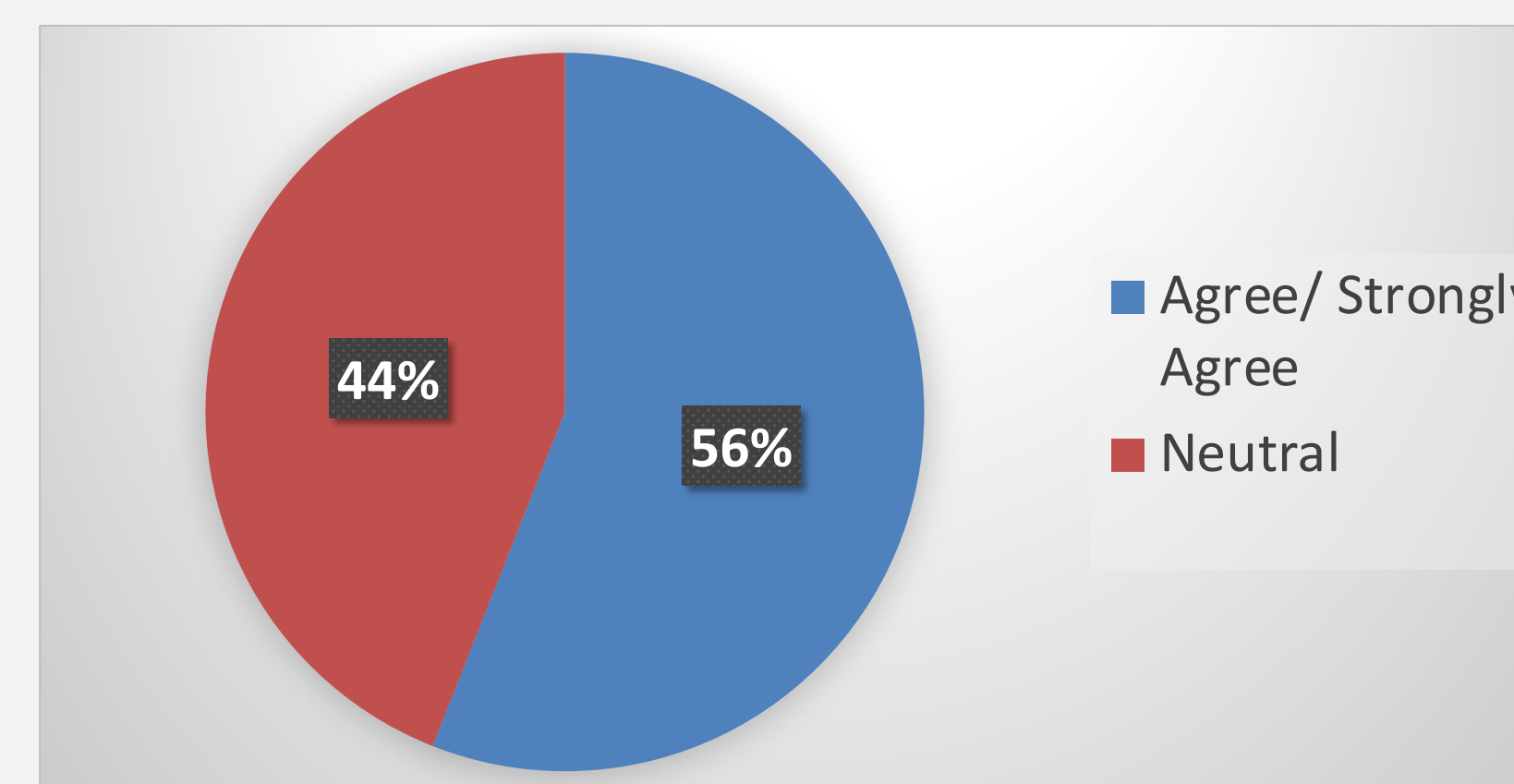
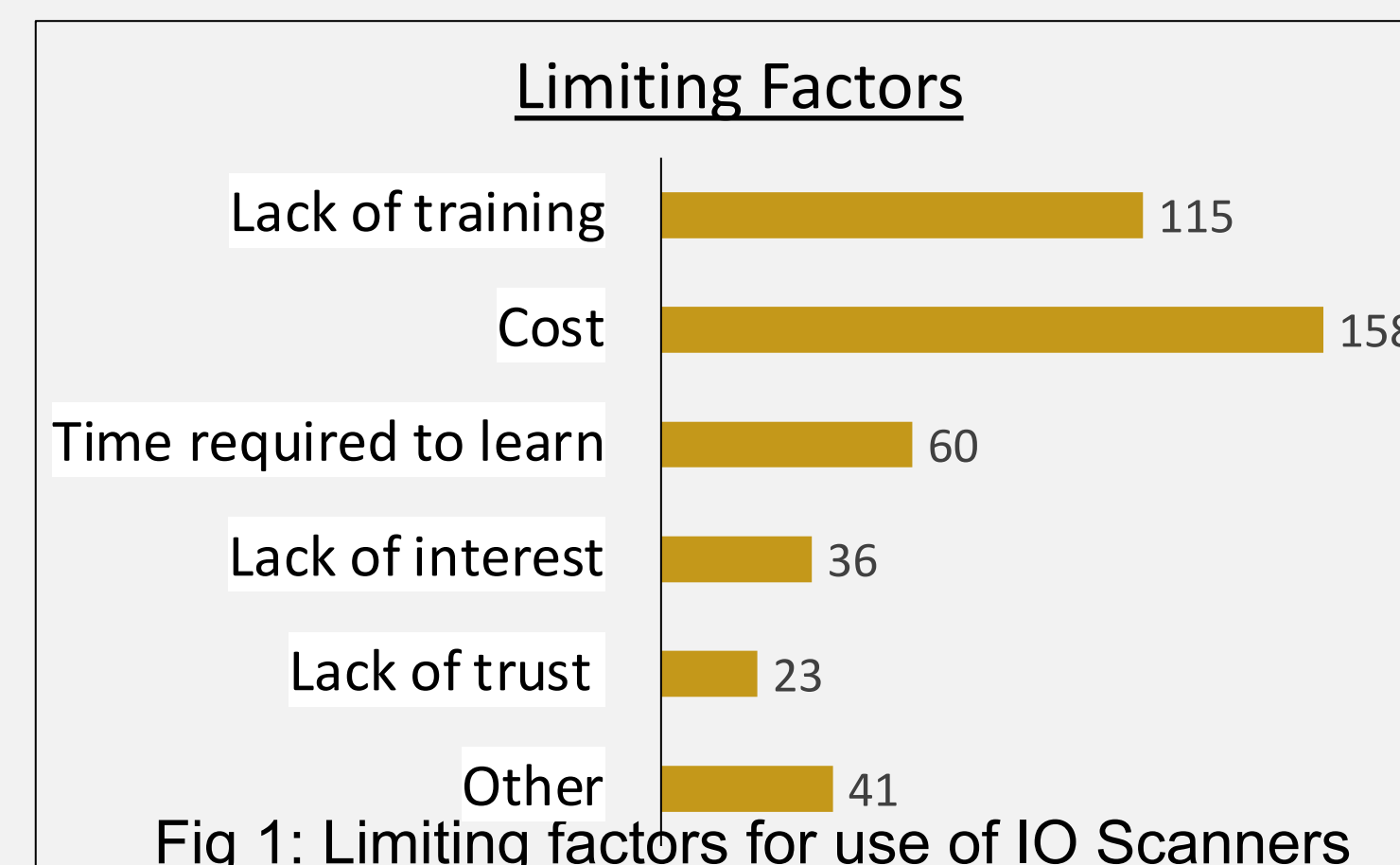


Fig 2: Agreement of CLP providers with the following statement: "Intraoral scanning is a viable option for fabrication of obturators for patients born with cleft lip/ palate."

## Results

- A total of 308 respondents answered the survey, with 58% female, 58% with greater than 10 years in practice, 64% in private practice, and 43% who treat patients with cleft lip and/or palate.
- The results of the study indicated that 73% of respondents either agree or strongly agree that they are willing to dedicate the time and effort required to learn about digital technologies.
- Those who self-reported use of an IO scanner had significantly higher agreement with statements about the ease of digital technology ( $p < 0.0001$ ), increased accuracy ( $p = 0.0003$ ), increased efficiency ( $p = 0.0004$ ), increased predictability ( $p = 0.0002$ ), increased patient acceptance/tolerance ( $p < 0.0001$ ), and that it's worth the investment ( $p < 0.0001$ ).
- Some commonly reported barriers are listed in Fig 1.
- The most common procedures indicated for IO scanner use were:
  - Orthodontic appliances (89%)
  - Diagnostic study models (73%)
  - Restorations (14%)
  - Obturators (17%)
  - Other appliances for treating cleft lip/palate (18%)
- Those who treat CLP indicating a significantly higher rate of using them for diagnostic study models (94% vs 54%,  $p < 0.0001$ )
- Those who treat CLP patients also indicated use of IO scanner for obturators at a higher rate (29% vs 5%,  $p = 0.0101$ ).

## Conclusion

- Digital technology is increasingly used in dentistry in this time and age, but is not utilized as much in pediatric dentistry as it is in other fields of dentistry.
- Our study has shown that practitioners in the US see digital scanning as a viable option for fabrication of obturators and that the major limiting factors seem to be cost and lack of training during residency.
- Our study has yielded promising results regarding incorporating digital dentistry to obtain impressions for obturators.
- We hope to encourage pediatric practitioners to employ digital dentistry and expand its use to treating children born with cleft and/or palate.