

Use and Comfortability with Single Tooth Anesthesia

Merva Razzak, DDS; Michelle Bowers, DDS; Tinnysha Chopra, DDS; David Yens, PhD; David Miller, DDS

One Brooklyn Health | Brookdale Hospital | Pediatric Dental Department

INTRODUCTION

Providing painless dentistry for the infant, child, and adolescent has been an ongoing challenge for the pediatric dentist. Both basic and advanced behavior guidance techniques have been at the forefront of the specialty, namely to help ensure a more successful completion of procedures requiring local anesthetic delivery. Understanding pain management in children has also been a challenge due to more subjective, yet commonly accepted, quantifications of pain (i.e. face pain scale) (3). Rapid injection of anesthesia is associated with worse injection site pain and decreased patient satisfaction (2). Single Tooth Anesthesia (STA), also known as the "Wand," was introduced to dentistry in 2007 as a means to provide a less painful local anesthetic experience as compared to the 150+ year old, traditional syringe. STA not only has a "wand" handpiece with a smaller needle, but also uses a computerized program to control anesthetic flow and provide low-pressure injections with precise anesthetic delivery (7). STA results in lower pain, discomfort, and intensity of physiological parameters, such as blood pressure and heart rate (4). More specifically, it has been found that children anesthetized with a traditional syringe had significantly higher mean pain scores and heart rates than those anesthetized with a computer-controlled Wand (6). Considering the relatively newer introduction of STA as compared to the traditional syringe, the paradigm is still shifting with regards to preference of local anesthetic delivery technique. To date, no studies have compared the use and comfortability of STA among trainees, academics, and practitioners in pediatric dentistry.

The objectives of this study are 1) to assess how often newer trainees, academics, and experienced pediatric dentists use STA; 2) to assess how comfortable newer trainees, academics, and experienced pediatric dentists are with using STA; and 3) to understand if those with more training and comfortability with STA have higher success in treatments requiring local anesthesia as compared to traditional anesthetic techniques.

METHODS

The study design is a cross sectional, prospective study which consisted of a 12 item questionnaire sent out via email to members of AAPD (American Academy of Pediatric Dentistry) including residents, practicing pediatric dentists, academics, etc. The questionnaire assessed participants training, use, and comfortability with STA. 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, chi-square and logistic regression analysis. Frequencies for each of the 12 questions were collected and summarized into relevant bars graphs. Cross tabulation and statistical significance were calculated to analyze each objective individually.

RESULTS

The total number of responses received for the 12-item survey was 64. Majority of responses were from current pediatric dental residents (n=44), followed by pediatric dentists practicing for 0-5 years (n=13), pediatric dentists practicing for 10+ years (n=5), pediatric dentists practicing for 5-10 years (n=2), and no responses from pediatric dentists in academia (Figure 1). 21 respondents (32.8%) believed they did have enough exposure to STA and 34 respondents (53.1%) did not believe they had enough exposure to STA, and 9 respondents (14.1%) did not know what STA was (Figure 2). A chi-square test analysis was completed cross-tabulating three different sets of survey questions. Figure 5 shows question five and nine (chi-square = 0.000, p-value = 0.000), the results of which were statistically significant.

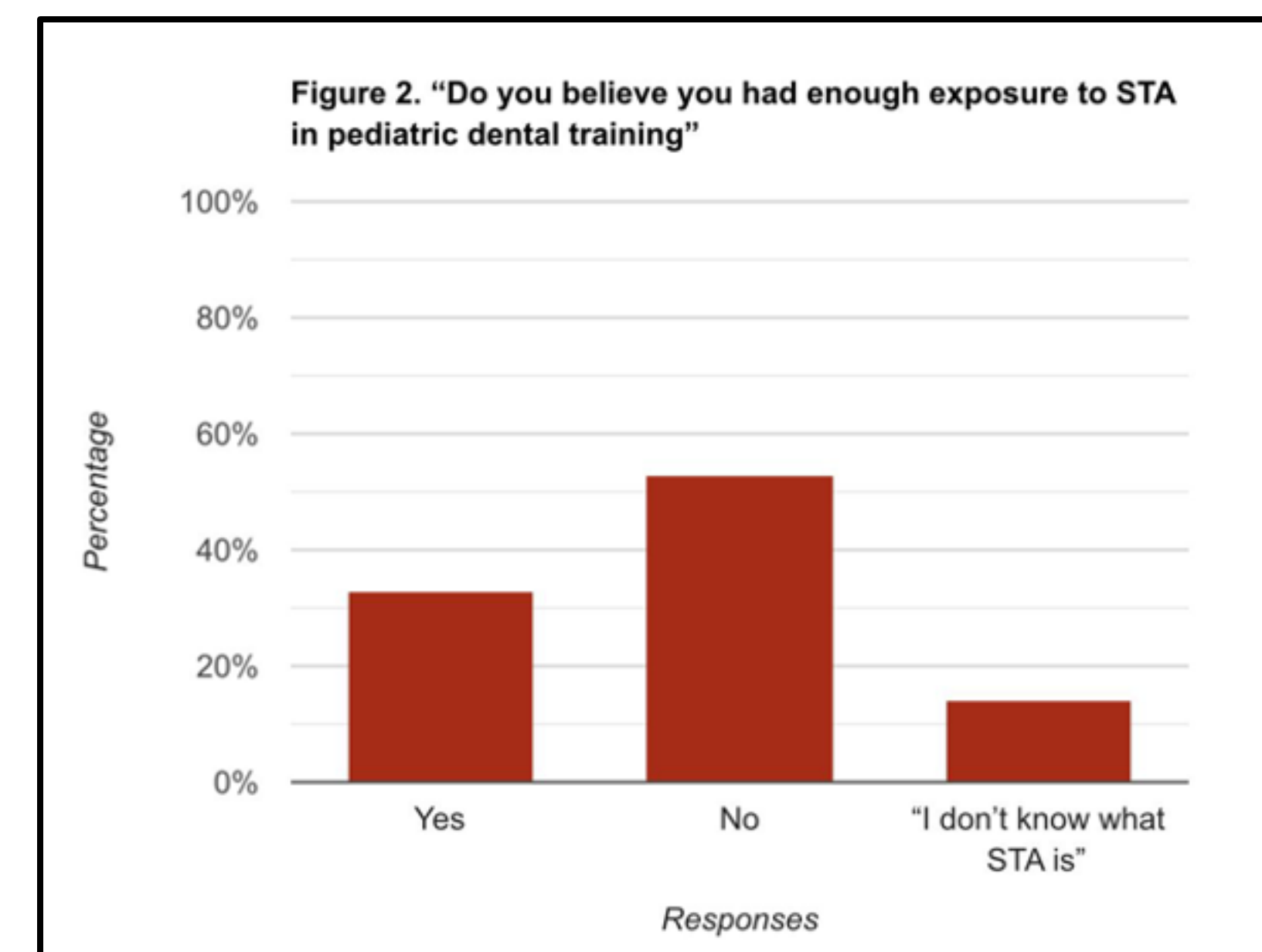
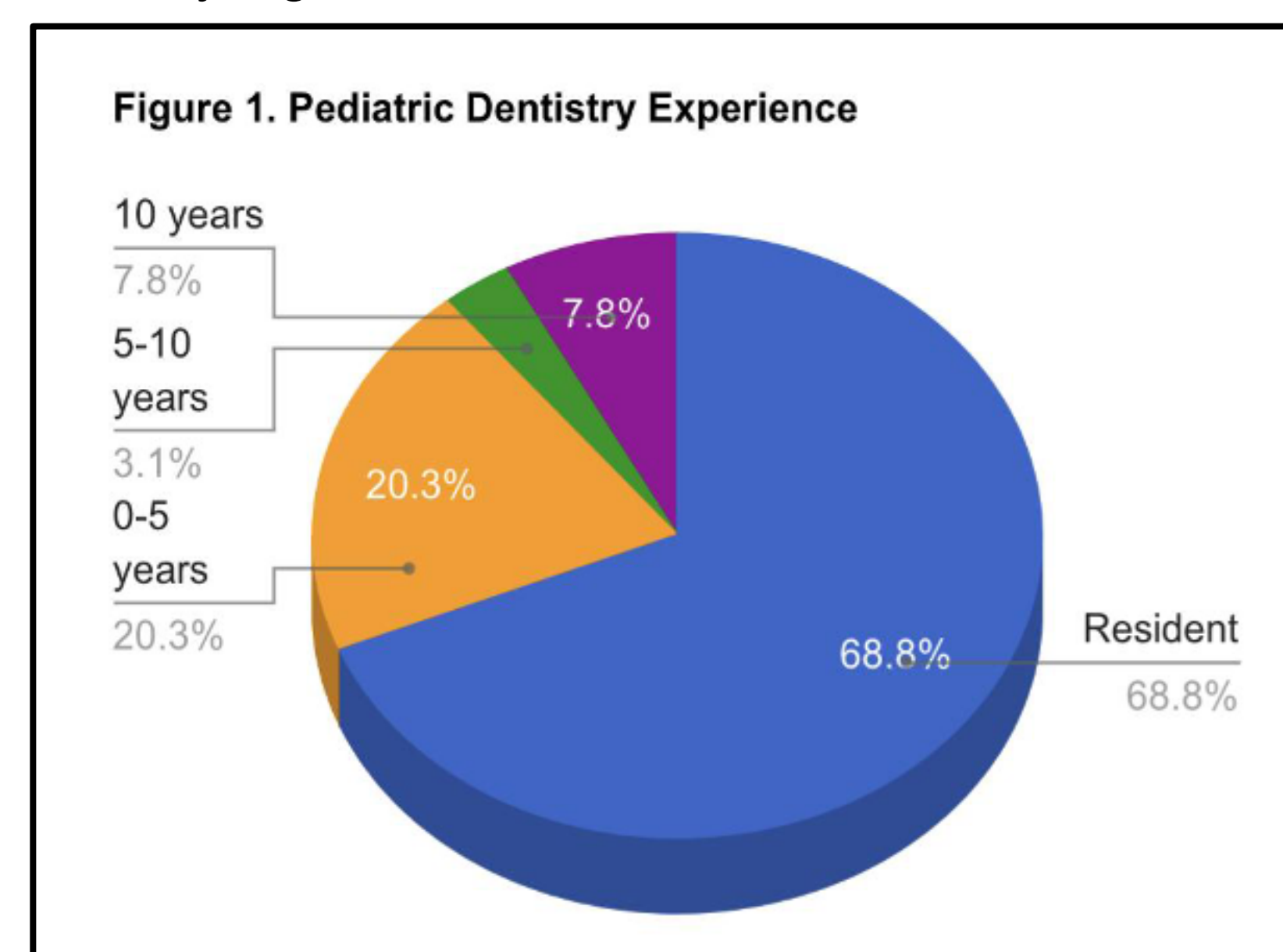


Figure 3. Pediatric Dentistry Experience vs. STA Use

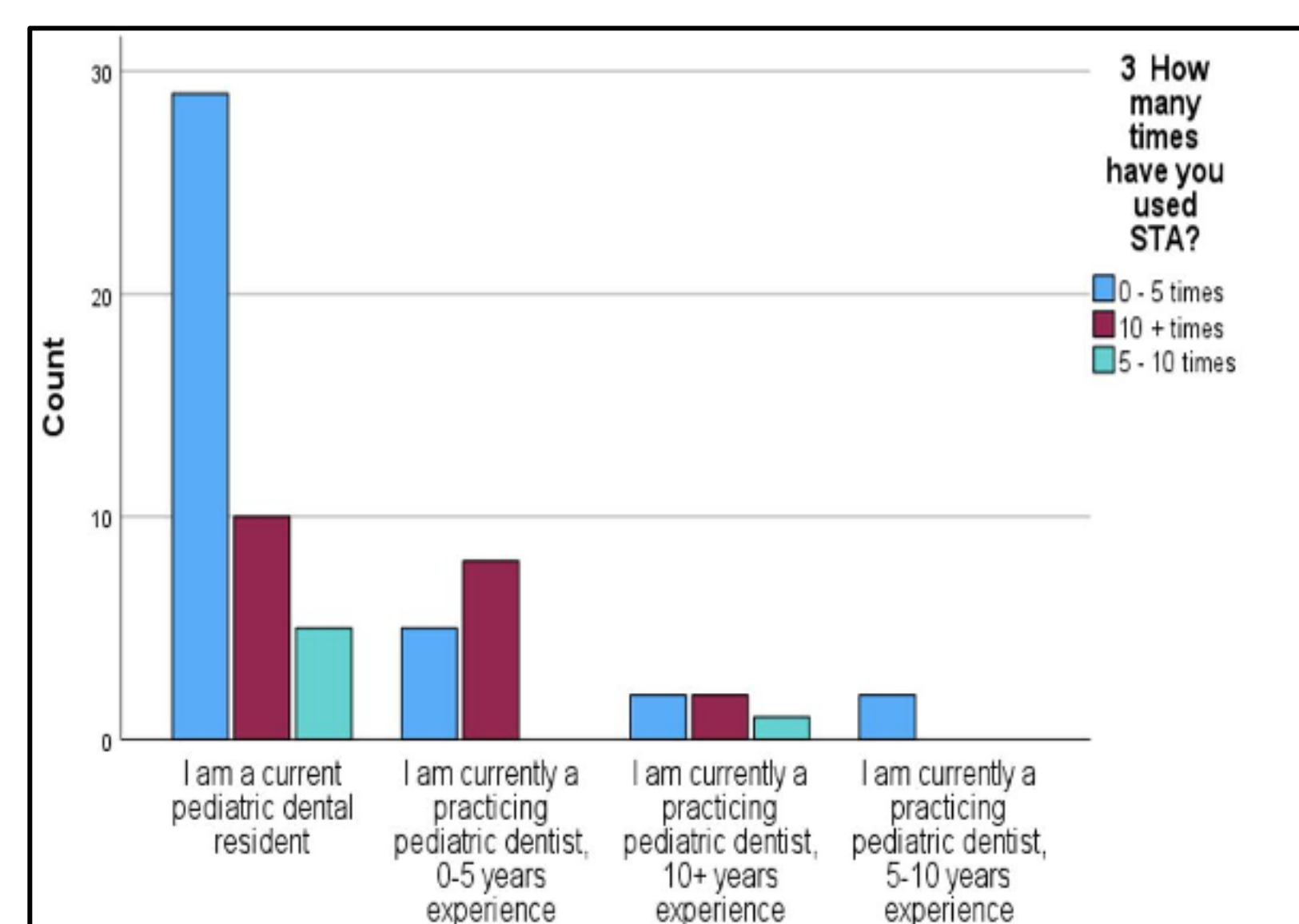


Figure 4. Pediatric Dentistry Experience vs. Comfortability Using STA

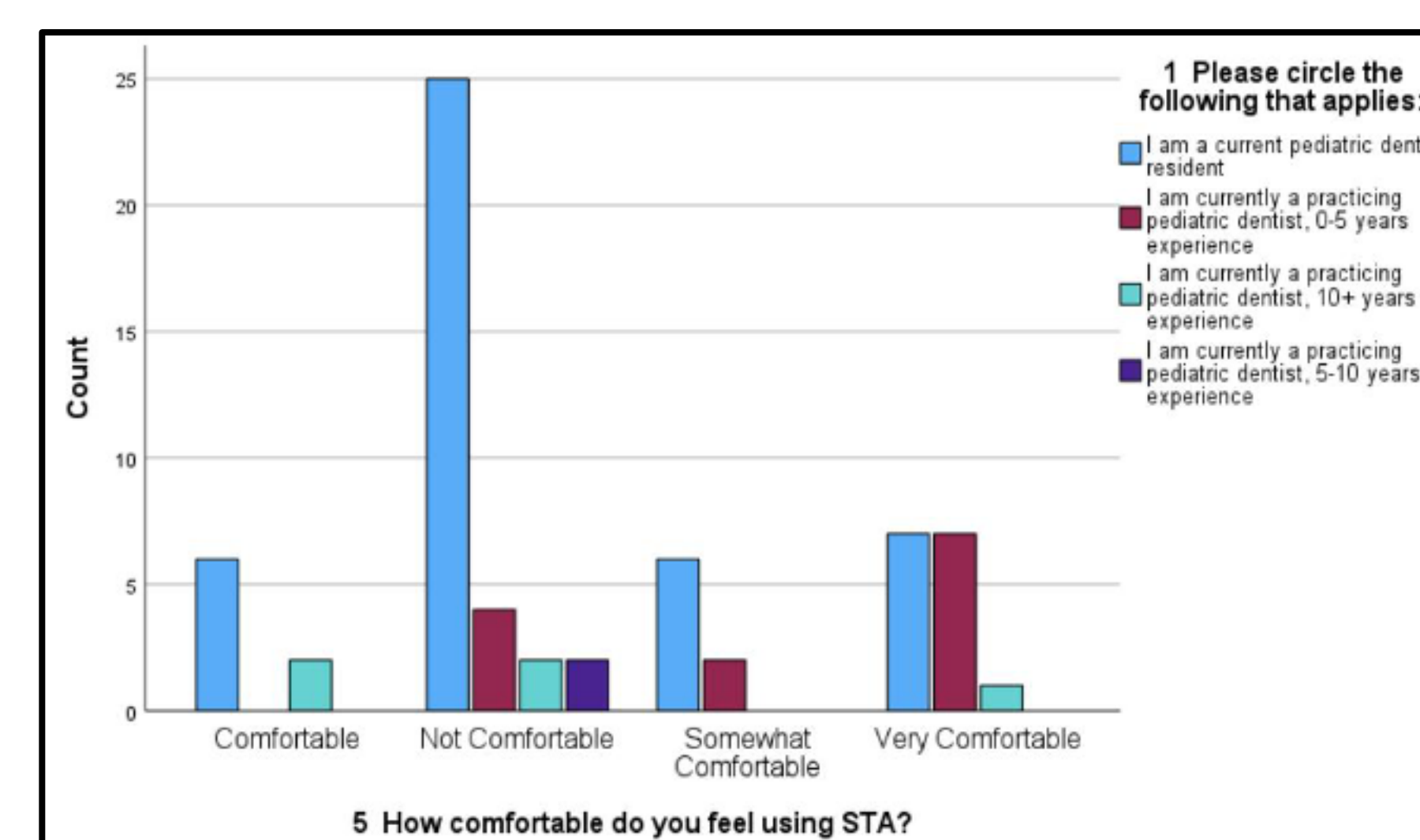


Figure 5. Comfortability Using STA vs. Effectiveness of STA

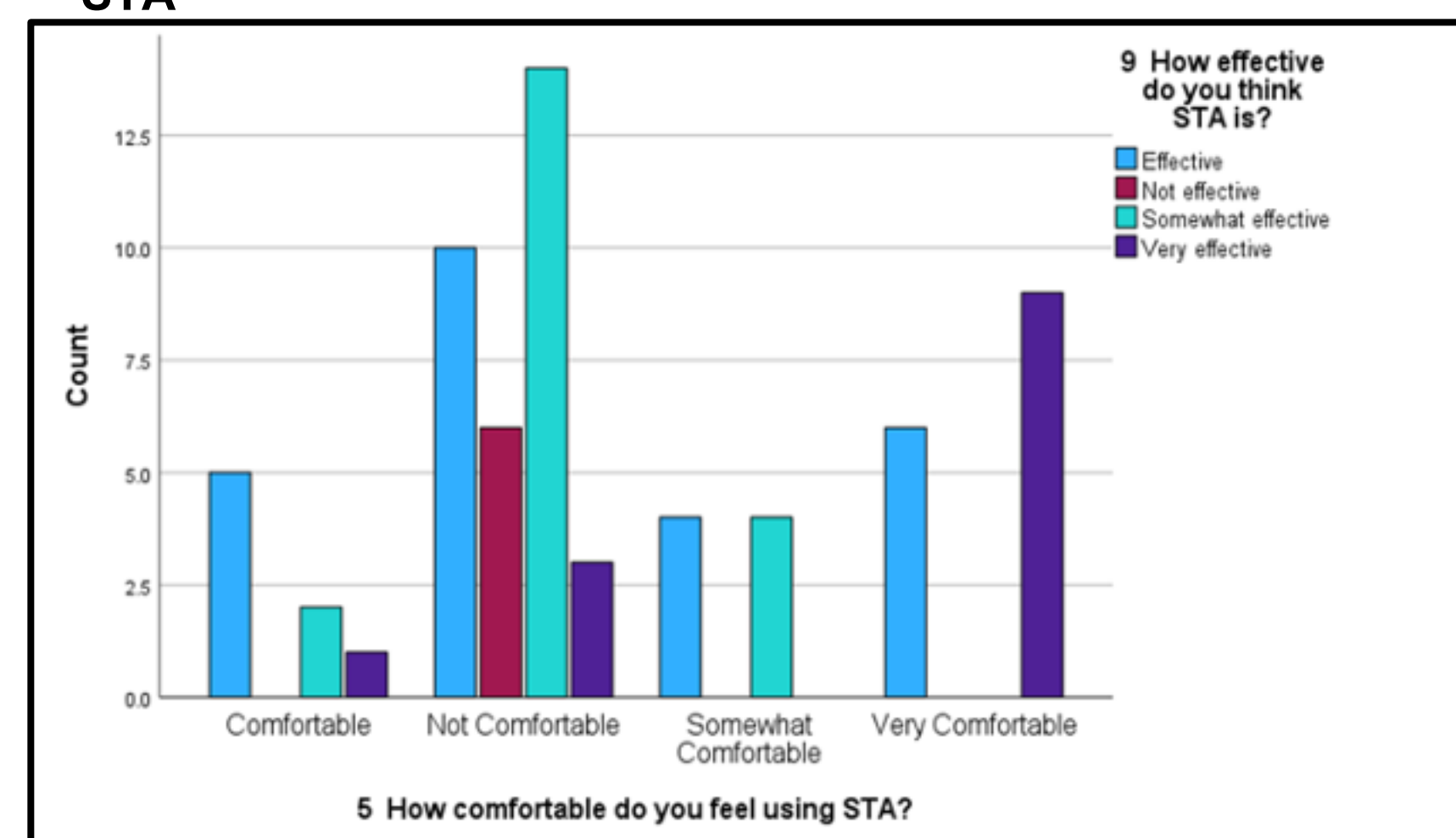
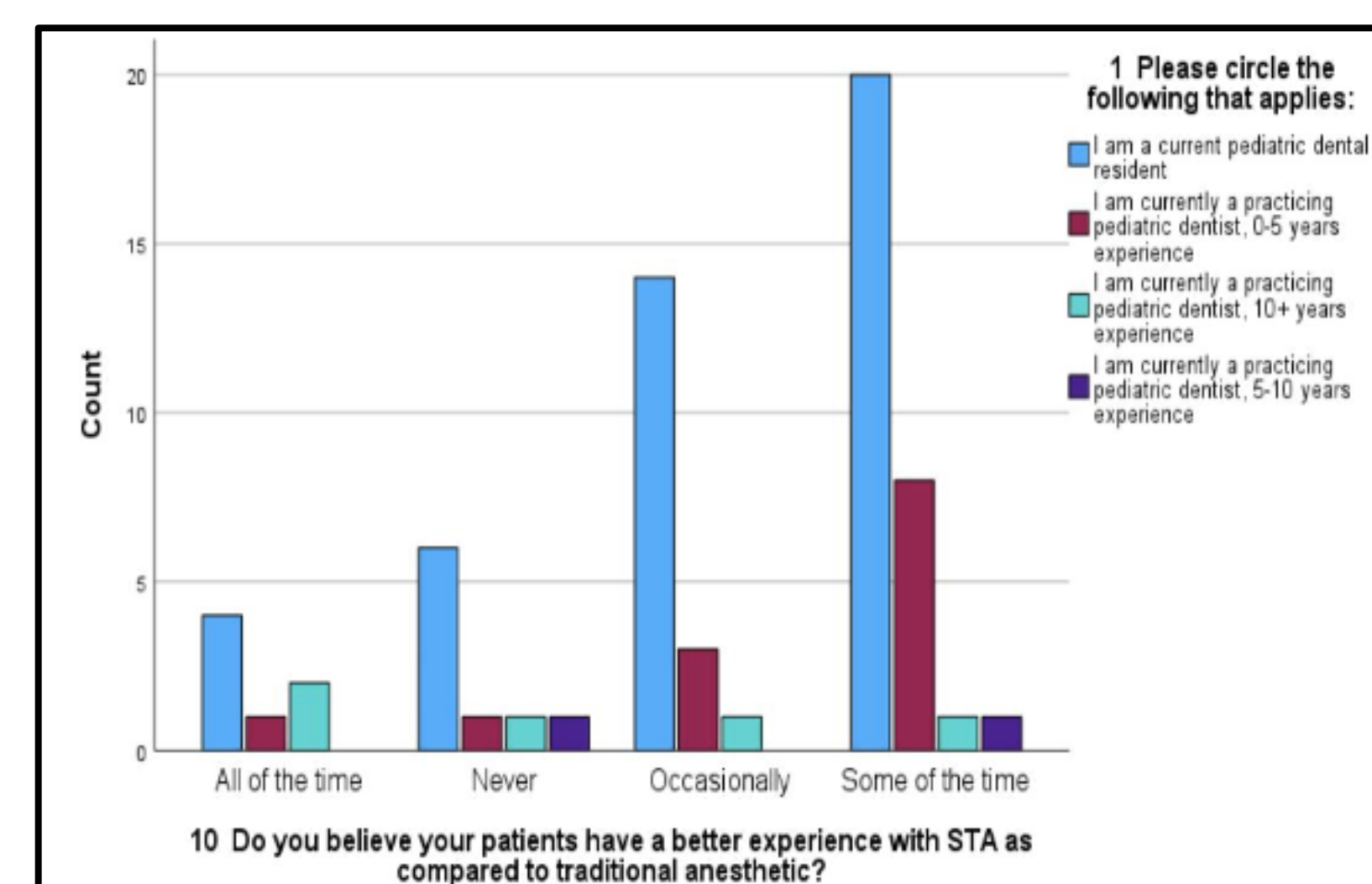


Figure 6. Pediatric Dentistry Experience vs. STA Experience



DISCUSSION & CONCLUSIONS

Figure 3 depicts a comparison of respondent experience in pediatric dentistry with number of times STA has been used. Although the results were not statistically significant (chi-square = 0.128, p-value = 0.085), current pediatric dental residents and those practicing for 0-5 years had used STA the most (more than 10 times). This difference could be due to a greater exposure to STA in recent years for pediatric dental residents.

Figure 4 shows a comparison of experience in pediatric dentistry with comfortability in using STA. Although the results were not statistically significant (chi-square = 0.429, p-value = 0.554), current pediatric dental residents and pediatric dentists with 0-5 years of experience feel more comfortable with STA than pediatric dentists with more than 5 years of experience. However, there were also many current pediatric dental residents that did not feel comfortable with STA. This difference could be due to varying levels of exposure to STA among different residency programs.

Figure 5 depicts a comparison of comfortability in using STA with subjective effectiveness of STA. The results of this comparison were statistically significant. All respondents who said STA was not effective also said they were not comfortable with STA. Participants who said STA was either effective or very effective also reported feeling very comfortable using STA. As a result, it can be concluded that one's comfortability with STA is significantly related to their view on how effective it is.

Figure 6 illustrates a comparison with experience in pediatric dentistry and participants' experience with STA versus a traditional syringe. Although the results were not statistically significant (chi-square = 0.429, p-value = 0.554), most pediatric dental residents and those practicing 0-5 years believed patients had a better experience with STA "most of the time". All practicing dentists had an equally low response to "never". This difference could be due to residents being the majority of participants in this survey.

Limitations of the study include a small sample size (n=64 responses). Furthermore, because a majority of responses were from pediatric dental residents and no responses were obtained from those in academia, the external validity is a limitation as it is not entirely representative of practicing pediatric dentists and academics. Lastly, many residency programs do not have STA, possibly accounting for the large number of respondents not knowing what it is. Future studies could be longitudinal and follow current residents and their use of STA for the next 10 years to assess how the paradigm of local anesthesia continues to evolve.

The conclusions that can be drawn from this study are:

1. There is a correlation between recent pediatric dental residents and newer graduates using STA more frequently.
2. There is a correlation between current pediatric dental residents feeling more comfortable with STA as compared to their more experienced counterparts.
3. There is a statistical difference between comfortability levels with STA and subjective effectiveness of STA.

REFERENCES:



References



Survey Questions