

## Introduction:

Preserving the primary molar has long been the goal for the pediatric dentist, as the tooth is the gold standard for space maintenance. Due to issues with patient cooperation and length of time necessary to complete endodontic therapy, this can often be challenging. A newer technique known as Lesion Sterilization and Tissue Repair (LSTR) is now being used more frequently to treat necrotic primary teeth which were often prematurely extracted. This procedure is completed utilizing triple antibiotic paste. TAP is primarily made up of ciprofloxacin, metronidazole, and minocycline. The 3 Mix Alternate comprises of clindamycin in place of minocycline<sup>4</sup>. LSTR and pulpectomy are the two main endodontic therapies used in the treatment of non-vital primary molars. LSTR is a technique in which an antibiotic paste is used as an antimicrobial against bacteria found in the pulps of infected primary molars. Primary molar pulpectomy is an established technique which consists of complete extirpation of the pulp and disinfection of the root canal systems, followed obturation of the canal(s) with a resorbable material. Of course, in some cases, extraction continues to be the best option<sup>1</sup>. The current utilization rate of LSTR by pediatric dentists in the US is not known. Given that provider experience and preferences affect treatment choice, the aim of this study was to evaluate how comfortable pediatric dentists and residents are with using LSTR versus pulpectomy or extracting primary molars.

## Methods

This was a cross-sectional study of AAPD members (residents and currently practicing pediatric dentists) conducted via a survey evaluating attitudes towards and utilization of LSTR by pediatric dentists.

- This research study was approved by the Institutional Review Board of One Brooklyn Health.
- A 15-question online survey was sent to all active AAPD members. The questionnaire was hosted by SurveyMonkey to meet security standards for the transmission of online data. The 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.
- A total of 50 responses were obtained. The data was analyzed to determine frequency of LSTR use by the providers and the correlation between provider attributes and experience with the frequency of using LSTR and comfort level with the procedure.
- Challenges in using LSTR in practice as well as likelihood of using LSTR in the future were also assessed.
- The collected data was analyzed by a statistician. Frequencies were reported and the Chi-Square test was used to evaluate the statistical significance of the differences between cohorts. The p-value was set at 0.05.

## Results

- A total of 50 responses were received.
- Of the respondents, 15 were still in residency, 9 had less than 1 year in practice, 12 had 1-5 years in practice, 7 had 5-10 years in practice, and 7 had over 10 years in practice.
- Most of the participants responded that they had never used LSTR before (n=33).
- Similarly, it was found that most respondents had used LSTR 0-5 times (n=44), followed by 10+ times (n=5). Only one person reported using LSTR 5-10 times (n=1).
- When asked about how comfortable providers are using LSTR, the two most selected options were not comfortable (n=23) and somewhat comfortable (n=14).
- When asked how frequently they use LSTR, most respondents reported never (n=30), seldom (n=14), or somewhat frequently (n=4). Only two participants replied "Very Frequently."
- A chi-square test was run cross-tabulating survey question six ("How comfortable do you feel using LSTR?") with survey question two ("How many years of experience in pediatric dentistry do you have, not including residency?") comparing providers with 5 or fewer years in practice with providers with more than 5 years in practice. The result of the chi square test was 0.077, and the result was statistically not significant. This indicates there was no relationship between the number of years in practice and comfort level using LSTR.
- A cross tabulation of survey question six ("How comfortable do you feel using LSTR?") with survey question five ("How many times have you used LSTR?") was also run, comparing providers utilizing LSTR fewer than 5 times with providers utilizing LSTR 5 or more times. The result of the chi square test was 5.81 and the result was statistically significant (p value of <0.02). Of the people who have used LSTR fewer than five times, an equal number reported being comfortable performing the procedure as not comfortable. However, for those utilizing LSTR 5 times or more, we found that they were all comfortable, indicating a positive relationship between comfort level and use.
- A chi square test was run cross tabulating survey question six ("How comfortable do you feel using LSTR?") with survey question three ("Which best describes the community in which you practice?") comparing providers located in rural/suburban locations with providers located in urban locations. The result of the chi square test was 0.150 and the result was not statistically significant. This indicates there was no relationship between location of practice and comfort level using LSTR.

## Figures:

Figure 1: Comfortability of Using LSTR vs. Years of Experience in Pediatric Dentistry

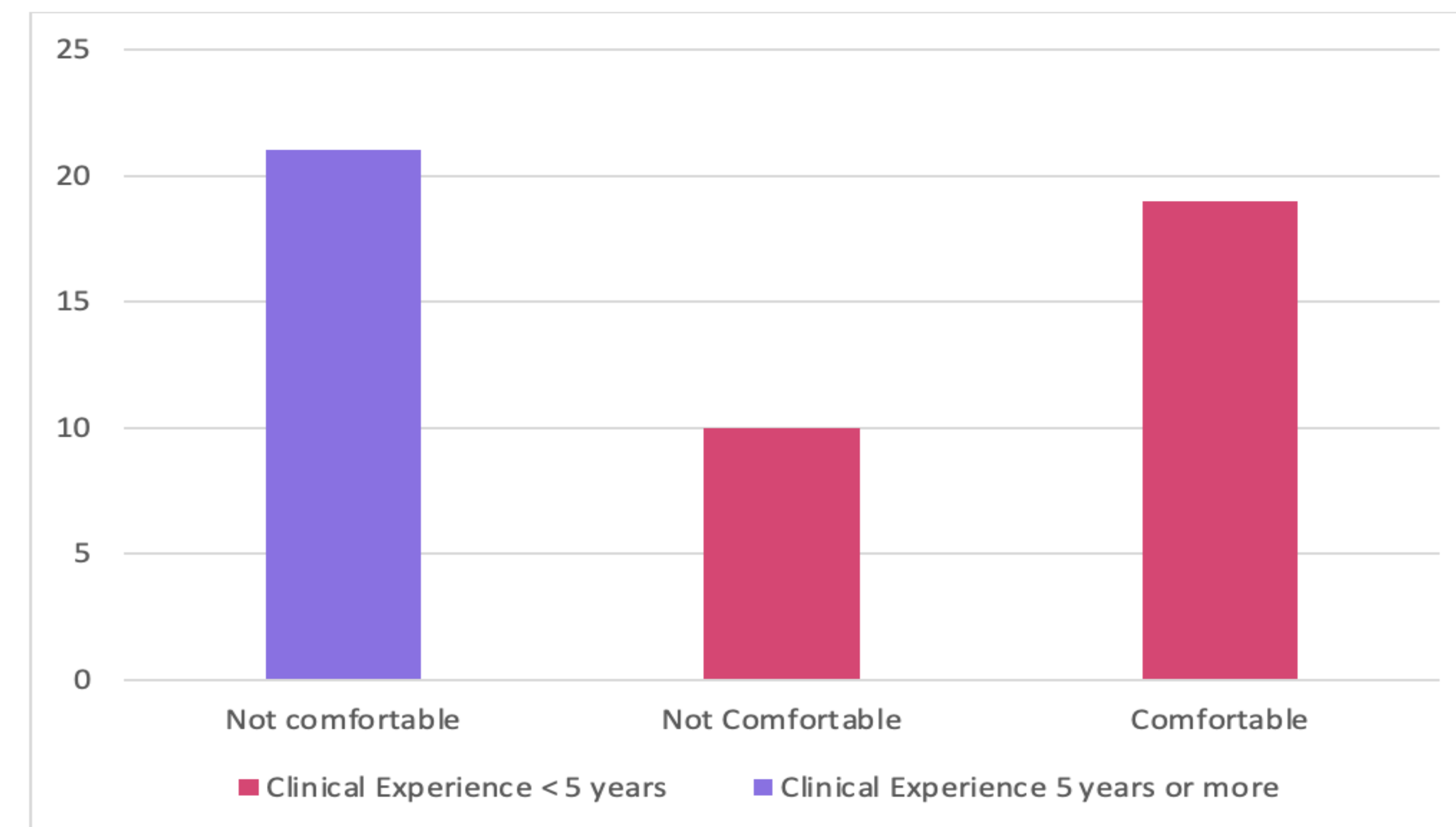


Figure 2: Comfortability of LSTR vs. How Many Times Have You Used LSTR

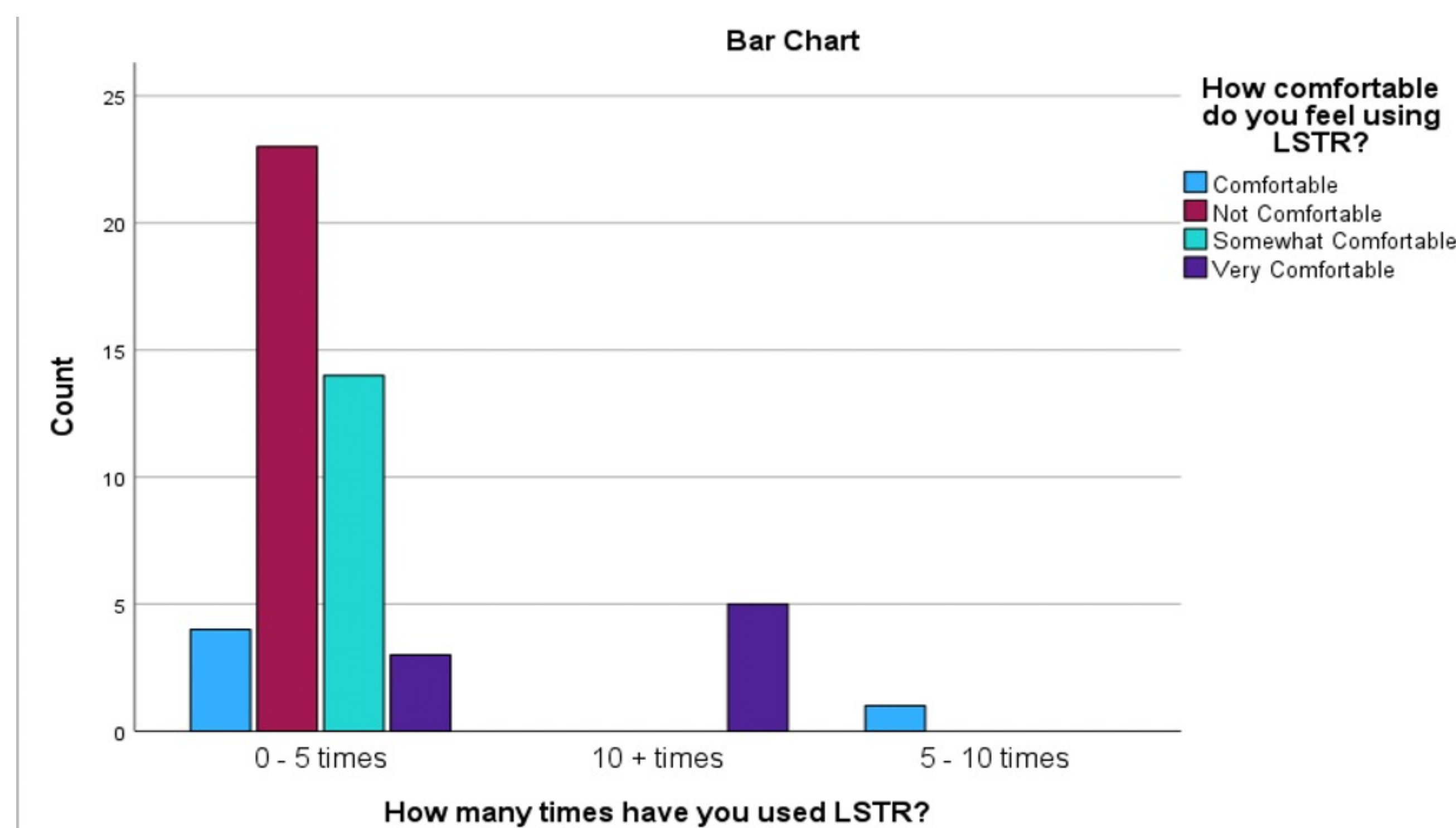
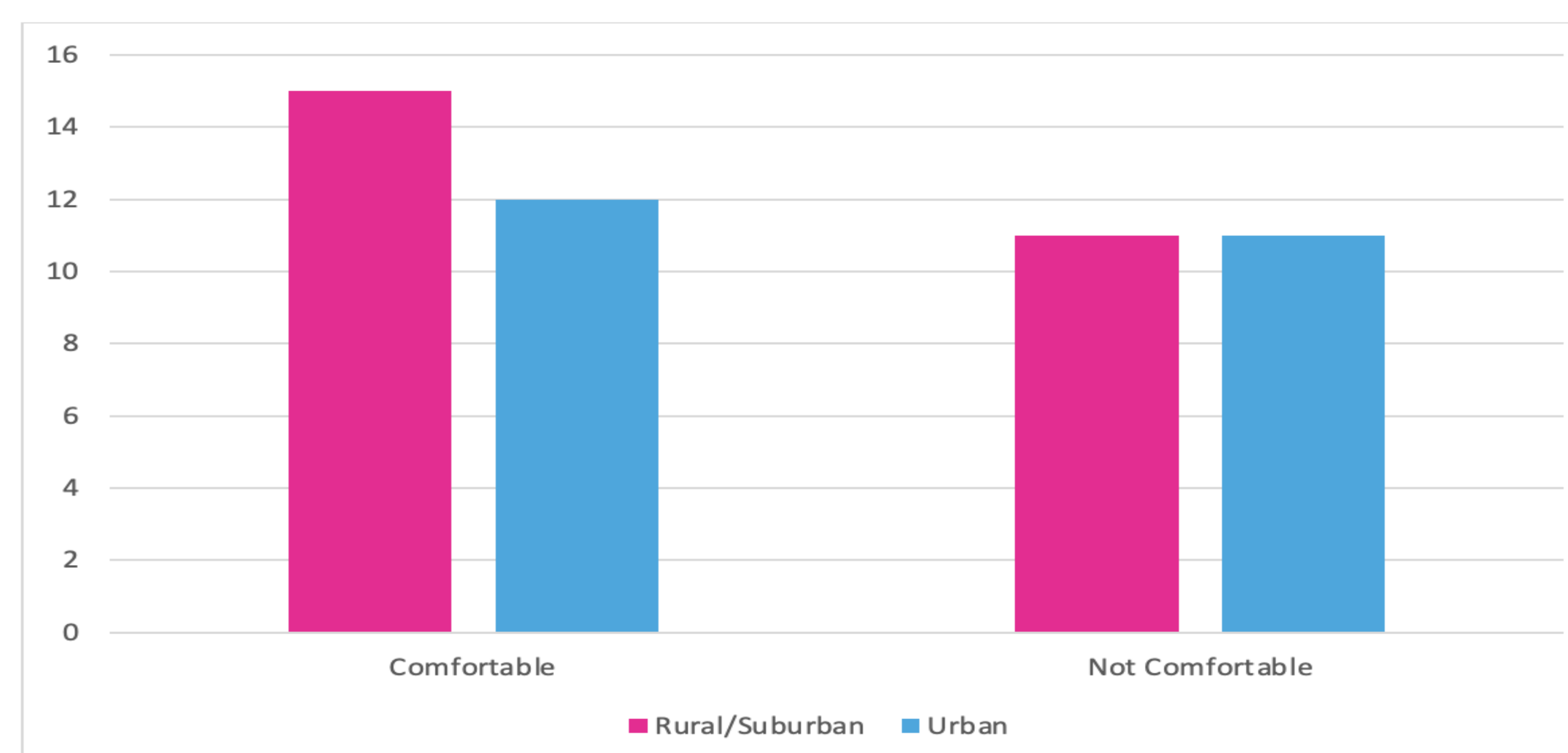


Figure 3: Comfort in Using LSTR vs Which Best Describes the Community in which you practice?



## Discussion

This study shows a current representation of the comfortability of using LSTR among AAPD members since most of the participants were either current residents or recent graduates having less than five years of experience. The majority of participants who felt comfortable using LSTR have been practicing less than 5 years. Participants with 5 or more years of pediatric dentistry experience felt not comfortable using LSTR (Figure 1).

**Figure 1** calls attention to the comparison of comfortability of use of LSTR vs. years of experience in pediatric dentistry. Based off these results we concluded that those practicing for less than five years felt more comfortable utilizing LSTR than participants who have been practicing for 5 years or greater, however, the result was not statistically significant. A relationship, if any, could potentially be due to residency programs introducing LSTR into their curriculum in recent years, which may not have been taught in the past.

**Figure 2** highlights the relationship between the comfortability of using LSTR vs how many times LSTR has been utilized. As would be expected, the data shows that having more experience using LSTR procedures is associated with a higher degree of comfort performing the procedure. Participants who have performed this procedure numerous times may have had access to CE courses, may be practicing in a population where parents are inclined to cover the costs of this treatment, or have graduated from residency training where programs had access to the triple antibiotic paste through compounding pharmacies.

**Figure 3** shows participants who felt comfortable using LSTR based on their location of practice. Results show that most participants who are located in urban communities felt less comfortable compared to participants practicing in rural/suburban locations, however the result was not statistically significant. Further studies could investigate the relationship between practice location and comfort level performing LSTR.

This study found the most common challenge of implementing LSTR into their practice was due to lack of experience or not comfortable with the procedure. The LSTR procedure aims to eliminate bacteria from the root canals by sterilizing the lesion and promoting tissue repair and regeneration by the host's natural tissue responses<sup>8</sup>. If more residency programs begin to incorporate LSTR procedures into their curriculum, there is a chance more participants would feel confident in performing the procedure in their practices once they graduate.

Based on the data collected, 20% of participants reported they felt equally comfortable performing pulpectomy and LSTR on a primary molar. 24% reported they felt more comfortable performing LSTR than pulpectomy. 26% of respondents felt more comfortable performing pulpectomy than LSTR and 30% reported they felt uncomfortable performing both pulpectomy and LSTR. This indicates that comfort level performing with LSTR and pulpectomy were similar. However, more participants felt uncomfortable with either procedure. Further research would be necessary to evaluate reasons of why participants did not feel comfortable with either endodontic therapy.

Limitations of the study include a small sample size of just 50 responses. Further, the majority of participants in this study were not familiar with LSTR and have not utilized LSTR before (n=33). Further research could focus on whether residency training programs had access to compounding pharmacies to provide triple antibiotic paste for the LSTR procedure. Lastly, assessing the frequency and utilization of LSTR based on type and location of residency training program might highlight differences in treatment selection among regions or program types.

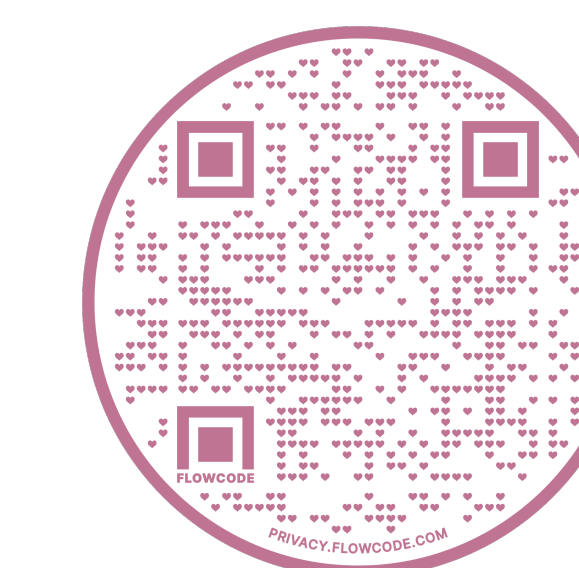
## Conclusion

Based on the results of this study, the following conclusions can be drawn:

- Participants with less than 5 years of experience in pediatric dentistry feel comfortable performing LSTR. Participants with 5 years or more of pediatric dentistry experience do not comfortable performing LSTR.
- Participants who have used LSTR 0-5 times do not feel comfortable using LSTR. Participants who have used LSTR 5-10 times feel comfortable using LSTR. Participants who have used LSTR more than 10 times feel very comfortable using LSTR.
- There was no significant relationship between practice location (rural/suburban vs. urban) and comfort level using LSTR.

## References

References:



Survey:

