Comparing 5, 15, and 23 Intraoral Image Sets for Pediatric Caries Diagnosis Using Teledentistry

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Background/Aims

Asynchronous teledentistry is increasingly utilized to expand access to dental care, particularly in settings with geographic or provider limitations. While teledentistry has demonstrated utility in screening and triage, there remains a lack of evidence-based guidance including the optimal number of clinical photographs required for accurate caries diagnosis. The purpose of this study was to compare diagnosis and confidence by dentists using asynchronous teledentistry when evaluating dental caries on the same clinical case when presented with three different sets of clinical images.

Methods

A convenient sample of licensed U.S. general dentists were invited to complete three online surveys over one month period using a secure web-based platform. Each survey presented the same clinical case with identical radiographs but a different number of clinical images (5, 15, and 23). Subjects independently assessed presence of caries, caries severity, and level of diagnostic confidence.

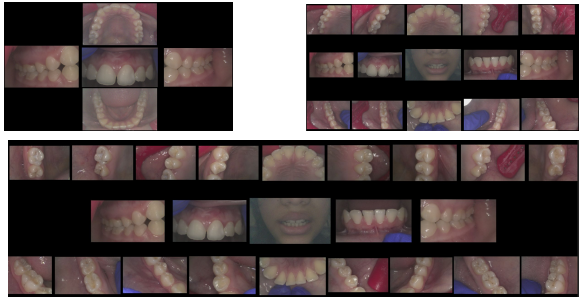

Figure 1.0: Clinical image sets subjects were asked to use (5-image, 15 image, and 23 image)

Results

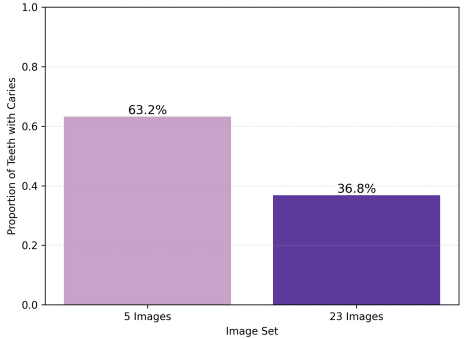

Figure 2.0: Percentage of teeth diagnosed with dental caries, 5 image set vs 23 image set (p=0.014)

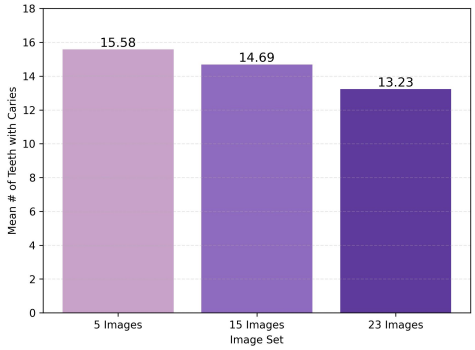

Figure 3.0: Mean number of teeth diagnosed with caries 5, 15, and 23 image sets

Results (cont.)

Of the 30 invited subjects, 19 responded and 13 completed all three surveys. 52.6% of subjects reported very limited experience with teledentistry. A significantly higher percentage of teeth were diagnosed with dental caries in the 5 image set (63.2%) compared to the 23 image set (36.8%) (p=0.014). No significant differences in diagnostic confidence were found when comparing across the 5-image, 15-image, and 23-image conditions. A limitation of this study is that provided anterior image in the 5-image set excluded the mandibular anterior teeth which may have influenced subject responses in confidence and caries diagnosis.

Conclusion

Diagnostic agreement between providers may be influenced by the quantity of visual information available. Standardized guidance on optimal image quantity is needed to improve consistency in remote evaluations These findings highlight the potential impact of image quantity on clinical decision-making. Further research is needed to better define the optimal number of images and the specific areas of the dentition required for accurate diagnosis.