Impact of Manikin-type on Preclinical Exercises in Predoctoral Pediatric Dentistry

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Background

- Most preclinical pediatric dentistry programs use standard adult manikins with pediatric typodonts during preclinical pediatric dentistry exercises.
- Pediatric manikins offer limited access and potentially greater difficulty for students.
- Dental students often lack self-evaluation competency during preclinical training.[1]
- Accurate simulation of clinical scenario (typodonts) and settings promotes student success and confidence prior to clinical experiences.[2]
- The purpose of this study was to comparatively evaluate the impact of the use of pediatric sized manikins on student's performance and self-evaluation in a preclinical pediatric dentistry course.

Methods

- Observational cohort study evaluated pediatric Class II & stainless-steel crown (SSC) preparations done by the same cohorts of students (N=160).
- Preparations were completed on the same mixed dentition typodonts, with either adult or pediatric sized manikin (independent variable).
- Student and faculty evaluated the preparations using predetermined parameters and grading rubrics.
- Class II preparations were evaluated using 18 different criteria, while SSC were evaluated on 10.
- Criteria met, critical errors, and student-faculty agreement on preps were the dependent variables.
- Differences in results by manikin type were compared with Wilcoxon Rank- Sum tests (a=0.05)

Results

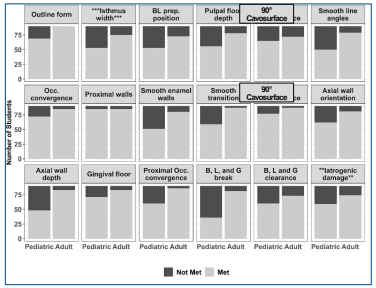

Figure 1. Student pass-rate for individual Class II prep criteria

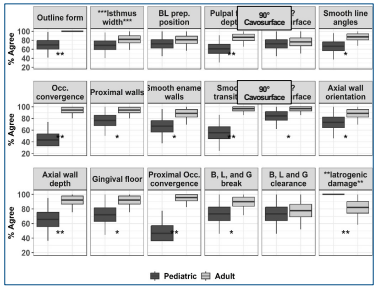

Figure 2. Percent agreement between faculty and student on Class II prep

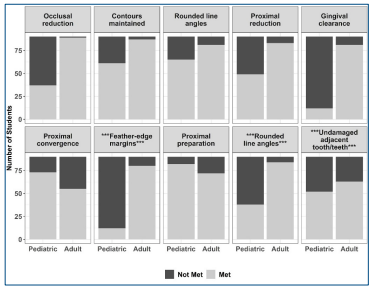

Figure 3. Student pass-rate for individual SSC prep criteria

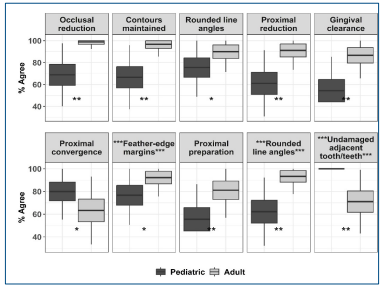

Figure 4. Percent agreement between faculty and student on SSC prep

With a change from adult to pediatric manikin (P<0.001).

- Class II: Critical errors increased from 27.8% to 60.0%
- SSC: Critical errors increased from 46.7% to 94.4%
- Class II: Percentage mean agreement decreased from 89.1% to 69.0%
- SSC: Percentage mean agreement decreased from 86.4% to 70.1%

Discussion

- Use of pediatric manikins results in lower criteria met as well as lower student faculty agreement upon evaluation in Class II and SSC preparations.
- This study demonstrates the unique challenges in pediatric dental training and development of trained workforce.
- The use of high-fidelity simulations plays a role in dental students' preclinical success and self-perception emphasizing the value of the high-fidelity simulation in predoctoral pediatric dental education.

Conclusions

- Pediatric manikins should be an essential component of pediatric dental curriculums to properly simulate clinical settings.
- Further studies are needed to determine how use of pediatric sized manikins in preclinical training plays a role in clinical success.

References

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2. Lee, B., Kim, J.-E., Shin, S.-H., Kim, J.-H., Park, J.-M., Kim, K.-Y., Kim, S.-Y., & Shim, J.-S. (2022). Dental students' perceptions on a simulated practice using patient-based customised typodonts during the transition from preclinical to clinical education. *European Journal of Dental Education*, *26*(1), 55–65.

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