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A. Arias^{1,*}, O.A. Peters¹ & I.L. Broyles²

¹Endodontics, University of the Pacific, Arthur A. Dugoni School of Dentistry, San Francisco & ²Medical Education Leadership, University of New England, Biddeford, USA

Innovations in teaching biostatistics to residents in endodontic fellowship: a pilot study

Aim The aim of this study was to develop, implement and evaluate an innovative transformational curriculum in biostatistics in response to the needs of fostering critical thinking in graduate health care education for a successful evidence-based practice and life-long learning education.

Methodology The curriculum was designed for first-year residents in a postgraduate endodontic program using a six-step approach to curriculum development, following the current Accreditation Standards for Advanced Specialty Education Programs in Endodontics. It applies a learner-centred approach, to provide sufficient understanding in research and biostatistics to allow residents to evaluate biomedical publications critically, knowledgeably and confidently, to design the best research strategy to address a specific problem and to analyse data by selecting the appropriate statistical test. Multiple instructional methods (lectures, targeted readings, small group discussions, videos, role plays and polls using an audience response system), formative and summative assessments (written tasks, simulation exercises, portfolios and pre-post knowledge tests) were used to accomplish the learning outcomes. The analysis of the achievement of the group of students and a satisfaction survey for further feedback provided to the residents at the end of the curriculum were used for curriculum evaluation.

Results All residents demonstrated competency at the end of the curriculum. From the 28-item selected-response extending matching and multiple-choice knowledge test, the total number of questions answered correctly at the end of the curriculum (22.33 ± 3.22) was higher than prior to implementation (10.33 ± 3.22). Correct answer rate changed from 36.9% in the pre-test to 79.8% in the post-test. No common errors were detected in the rest of the assessment activities. All participants completed the questionnaire demonstrating high satisfaction for each independent category and with the overall educational program, instruction and course in general.