



Implementation and evaluation of a genetics curriculum to improve obstetrician-gynecologist residents' knowledge and skills in genetic diagnosis and counseling

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KEY WORDS

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Objective: This study was undertaken to develop, implement, and evaluate a genetics curriculum for obstetrician-gynecologist residents.

Study design: We prospectively evaluated the effect of a genetics curriculum on obstetrician-gynecologist residents' knowledge and skills. Residents completed a needs assessment and pretest. Educational intervention included 2 3-hour didactic sessions with 1 hour of lecture followed by case discussion and 1 3-hour session of experiential learning using standardized patients who evaluated residents' knowledge and skills in taking family history, drawing genetic pedigrees, and counseling patients. Posttest scores were compared with pretest scores.

Results: Needs assessment was completed by all 40 obstetrics and gynecology residents and identified limited and variable genetics education in medical school. Twenty-eight of 40 residents attended the entire educational intervention and completed the pretest and posttest, and 25 of 28 showed improved test scores. Residents stated that they were more confident in their ability to take a family history, record a 3-generation pedigree, and counsel patients about genetic conditions after completion of the genetics curriculum.

Conclusion: This multifaceted genetics curriculum improved residents' knowledge of genetics as well as their confidence in applying genetic concepts as assessed by the pretest and posttest and by their comments in the debrief session.

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With the completion of the human genome project in 2001, the identification of disease-causing genes has dramatically increased.¹ Even prior to the completion of the human genome sequence, educators in genetics

recognized that practicing physicians had limited knowledge about genetic tests and the implications for medical practice.² One group evaluating the genetics knowledge of primary care providers found that “knowledge of

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genetics and genetic tests was increasing among physicians, particularly among recent graduates and physicians who are exposed to patients with genetic problems in their practices but that deficiencies still remain.”³ This group stated that although “medical school courses in genetics may improve knowledge, it was not sufficient.” Rather, they determined that greater emphasis is needed at all levels of medical education.³

Obstetrician-gynecologist (OBGYN) residents are expected to have a broad working knowledge of genetics to provide patients with accurate and up-to-date care. This depends on an understanding of preconception and prenatal risks; family history and cancer risks; and disease risk for adult-onset disorders such as osteoporosis, diabetes, hypertension, and stroke. OBGYN residents are also expected to teach medical students, physician assistant students, and junior residents. A resident spends 20% to 25% of the average week at work supervising, evaluating, or teaching others.⁴

Most OBGYN residents have limited experience with genetics because of fragmented medical school curricula, rapidly changing knowledge about genetics, and the previous view of genetics as pertaining only to rare disorders.^{5,6} Curriculum change in OBGYN requires evaluation of the learners, the teachers, and the program as noted by Metheny et al.⁷ Specifically, the “purpose of the evaluation is to determine the impact of the curriculum on and to evaluate the learner.” We have incorporated several evaluation techniques in our genetics curriculum for OBGYN residents including multiple-choice question examinations, direct observation with checklists, and objective structured clinical examination (OSCE).⁷

Background

In 2001, a genetics curriculum for OBGYN residents was presented by one of the authors (C.J.M.) as an Association of Professors of Gynecology and Obstetrics (APGO) workshop.⁸ This proposed curriculum included genetic counseling, family history, 3-generation pedigrees, multifactorial inheritance, mendelian and nonmendelian inheritance, chromosome abnormalities, single-gene disorders, population genetics, screening for at-risk populations, cancer genetics, molecular diagnostics, and prenatal screening and testing. Prior to the implementation of this study, OBGYN residents at this institution learned genetics by individual study and periodic lectures about genetics topics and as part of clinical experience.

The purpose of this study was to test the effectiveness of a structured multifaceted curriculum on the test scores of OBGYN residents at 1 large, urban, university-based residency program. We used the core competencies for genetic knowledge, skills, and attitudes for all health care providers established by the National Coalition for

Health Professional Education in Genetics to develop the learning objectives.⁹ Although not every patient or family will require chromosome analysis or molecular testing, it has been noted that important information about disease risk may be identified from the family history, especially when recorded in the 3-generation pedigree format using standard pedigree nomenclature.¹⁰

Standardized patients

A standardized patient (SP) experience was used to help teach and evaluate the OBGYN residents’ knowledge and skills in taking a family history and drawing a 3-generation pedigree. The use of SPs in medical education dates back to the 1960s.¹¹ Standardized patients are trained to portray a specific patient role and to report objectively on what takes place in the encounter.^{12,13} Furthermore, the use of SPs and simulations can provide a means by which defined performance criteria can immediately be evaluated by faculty and peers to permit feedback and practice in a realistic but less threatening educational environment.¹³⁻¹⁵ In 1982 Laube et al¹⁶ reported on the effectiveness of a clinical skills instruction program for learning about the acute abdomen.

It has been demonstrated that OSCEs are psychometrically stable and valid as evaluation tools.¹⁷⁻¹⁹ Because of their validity and reliability, international and national licensure boards have adopted OSCEs as a method to evaluate clinical skills of candidates. In 2003 the National Board of Medical Examiners initiated the use of SPs and a multiple OSCE as part of the step 2 clinical skills examination. Because of the usefulness of these methods of instruction and evaluation in education of medical students and residents and the importance of the step 2 clinical skills examination as part of the licensing examination, a clinical learning and simulated skills center was established at the George Washington University School of Medicine and Health Sciences.

Material and methods

This educational research project was approved by the Institutional Review Board at the George Washington University School of Medicine and Health Sciences (GWU). The curriculum presented at APGO was adjusted to fit into the OBGYN competency skills program at GWU, and a needs assessment survey was conducted addressing demographic information, prior educational experience in genetics, advanced degrees, and a Likert rating scale (ranging from 1 to 5) of residents’ knowledge and comfort level about genetic diagnoses and testing.²⁰ The faculty consisted of medical geneticists, a genetic counselor, maternal-fetal medicine specialists, and general obstetrician/gynecologists.

Following completion of the needs assessment, all residents completed a 40-item, multiple choice question

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