Reactions of Surgical Program Directors to a Web-Based Interactive Educational Program Focusing on Cognitive Skills

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OBJECTIVE: To assess reactions by program directors (PDs) to a preview of a scenario from the Fundamentals of Surgery Curriculum (FSC), which is a case-based interactive curriculum developed by the American College of Surgeons's (ACS) Division of Education and designed to be delivered online to first-year (PGY-1) surgical residents.

DESIGN: After previewing a scenario, each PD completed a questionnaire requesting age and ratings of comfort using computers, the scenario's utility in addressing 9 educational goals (eg, provides a solid foundation for future learning), and 6 separate features of the scenario (eg, ease of use and feasibility). All ratings were based on a 1–9 scale. For items related to educational goals, ratings were anchored: 1–3 = poor/needs revision; 4–6 = adequate/as good as current methods; 7–9 = excellent/superior to current methods. Informal discussions were also conducted and comments were collected.

SETTING: October 2007 ACS Clinical Congress.

PARTICIPANTS: In all, 31 PDs participated in the study.

RESULTS: Most PDs perceived that the scenario addressed 8 of the 9 educational goals in a manner superior to current methods [eg, provides a solid foundation for future learning (97%), challenges residents (90%), and delivers content consistent with current practices and/or evidence (90%)]. The mean ratings of all scenario features were 7 or greater on the 9-point scale.

CONCLUSION: Most PDs reacted very positively to a preview of FSC perceiving that it can address several important educational goals in a manner superior to existing methods. Comments from PDs suggest a high level of interest in incorporating FSC into their residency programs as well as participating in a coordinated multi-institutional evaluation project.

The results provide baseline data concerning PD expectations of the utility of FSC that will help to guide and evaluate further developments and applications of this curriculum. (J Surg 65: 470-475. © 2008 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: computer-based education, computer-assisted instruction, Web-based curriculum, general surgery residency training, surgical knowledge

COMPETENCY: Knowledge, Patient Care, Systems-Based Practice

INTRODUCTION

Residents play a pivotal role in delivering safe, effective, and efficient care to surgical patients. However, they enter residency training with significant variability in their knowledge and skills, which can affect learning as well as patient care. The American College of Surgeons's (ACS) Division of Education has created the Fundamentals of Surgery Curriculum (FSC) in an effort to provide a comprehensive, standardized educational experience that will (1) support and accelerate resident learning and performance in key clinical areas, (2) help address the variability so often observed among entering residents with regard to clinical knowledge and cognitive skills, and (3) reinforce the Core Competencies defined by the Accreditation Council on Graduate Medical Education.

FSC is a case-based interactive curriculum designed for on-line delivery to first-year (PGY-1) surgical residents. Each of 11 modules is subdivided into topical areas, which in turn include a variety of virtual scenarios. Each scenario presents a patient, and the resident can "take a history," "perform" a physical examination, order tests, review records, and recommend therapeutic interventions. The toolbar allows access to the patient's virtual chart, appropriate reports, and information gathered by the resident during the patient history, physical examination, and diagnostic testing. Specific feedback is provided for every

action taken by the resident while interviewing, examining, preparing a diagnosis, and managing the patient. A wide variety of relevant references is embedded in each scenario for "just-in-time" information and support. In addition, residents are guided to specific reading materials that are too large to embed in the course for relevant background information at specific points in each module. Successful completion of each scenario requires the resident to follow the critical-thinking strategy promoted by the curriculum, which emphasizes differential diagnoses and hypothetico-deductive reasoning. If a resident's actions in caring for a virtual patient result in dire consequences, then the resident is required to start over again (an opportunity rarely granted in real life).

When the FSC is completed, each resident will have presented a diagnosis and recommended treatment for scores of "patients," each time practicing the critical thinking that contributes to optimal outcomes. The program is intended as a learning exercise, not as a summative assessment tool. Thus, the resident can explore various alternatives and receive feedback without concern about being formally evaluated. There is no scoring of resident performance in completing the modules; however, an automated tracking system records resident progress in each scenario. This allows the program director (PD) to determine for each resident whether an assignment is in progress, has been completed, or has not yet been started, as well as the amount of time logged onto the system. When complete, the FSC will be composed of 11 online modules with approximately 100 interactive case-based scenarios that present the foundation of surgical cognitive content for PGY-1 residents across all surgical specialties.

The purpose of the current study was to assess the reactions of PDs to a preview of FSC.

METHODS

General Surgery Residency PDs (n = 31) independently previewed the FSC during the October 2007 ACS Clinical Congress. These PDs had responded to an invitation posted on the Association of Program Directors in Surgery's listserv. PDs who responded were given appointments for the previews based on their requests. Once the available preview times were filled, no additional PDs were scheduled. However, several PDs took advantage of the opportunity to preview the curriculum when a computer became available. Only PDs who completed an entire scenario were asked to participate in the survey. All scenarios that were available for review were from the On-Call Module on Emergency Department Evaluation of Acute Abdominal Pain. As such, they involved the patient encounter and a decision about whether the problem required urgent intervention. In nonemergent situations, opportunities were provided for a detailed patient history, differential diagnosis, complete physical examination, test orders, definitive diagnosis, and therapeutic intervention. In 2 scenarios, incorrect decisions lead to life-threatening consequences for the patient. PDs were given a choice of scenarios to review, but the choice of scenario was not

recorded. Many PDs completed the scenario that involved a patient with acute pancreatitis. A scenario about a patient with a contained ruptured abdominal aortic aneurysm was also available for review, as were scenarios about acute cholecystitis, acute appendicitis, sigmoid diverticulitis, and other emergency department scenarios that involved acute abdominal pain.

Each PD spent approximately 30 minutes engaged in an instructional scenario and an interactive scenario and then completed a questionnaire (Appendix A) that requested the respondent's age, a rating of overall comfort level using computers, ratings of the scenario's utility in addressing 9 separate educational goals (eg, provides a solid foundation for future learning), and ratings of 6 separate features of the scenario (eg, ease of use and feasibility). The choice of educational goals and features was derived from the objectives of the curriculum as well as previous studies that have evaluated Web-based educational modules. All ratings were based on a 1–9 scale. As shown in Appendix A, ratings for items 1 through 9 that addressed educational goals were anchored as follows: 1–3 = poor (revisions are needed); 4–6 = adequate (as good as currently used methods); and 7–9 = excellent (superior to currently used methods). For items 10 through 15 that focused on features, respondents were asked to provide feedback on separate 9-point rating scales.

RESULTS

Of the 31 PDs who participated in this study, 7 (23%) indicated that they served as chief of surgery at their respective institutions, in addition to serving as PD. The breakdown of PD age was as follows: 35–45 (n = 11; 35%), 45–55 (n = 8; 26%), and 55–65 (n = 12; 39%). PDs rated their comfort using computers on 9-point scale that ranged from 1 (very uncomfortable-rarely use) to 9 (use all the time). PD ratings of comfort using computers ranged from 5 to 9 (mean = 8.0; SD = 1.3). Most PDs perceived that the scenario addressed 8 of the 9 educational goals in a manner superior to currently used methods (Fig. 1). Mean ratings of all scenario features were 7 or greater on the 9-point scale (Fig. 2). Self-rated comfort in use of computers correlated directly with ratings of ease of use (r = 0. 49, p < 0.01) but not with any of the remaining ratings. PDs under 45 years of age generally indicated a higher level of comfort with computers than did older PDs, whose comfort levels were more variable. None of the age-related differences was statistically significant.

DISCUSSION

The World Wide Web has been used extensively in recent years to deliver educational material across a wide range of contexts. Evidence from educational research and evaluation studies indicates that for highly motivated and self-disciplined students, distance-learning methods can be as effective as traditional teaching.[1] Web-based instruction, such as that delivered by