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Systems-based practice: learning the concepts using a teamwork competition model

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Abstract

BACKGROUND: Systems-based practice (SBP) is a core competency of the Accreditation Council for Graduate Medical Education (ACGME) that must be integrated into residency training. We sought to develop a method to improve resident understanding using a teamwork competition model.

METHODS: The residents were given a pretest to assess their understanding of SBP followed by a didactic lecture. They were then divided into teams to solve a programmatic "problem" in the residency. Each team had to prove that their solution best fulfilled the expectations of SBP. Their solutions were then presented at a departmental conference followed by a post-test to evaluate knowledge.

RESULTS: In the pretest, 33% of the residents understood what SBP meant and only 15% knew the components of SBP. In the post-test, this increased to 85% and 89%, respectively.

CONCLUSIONS: SBP is a competency mandated by the Accreditation Council for Graduate Medical Education in residency training. Using a novel approach, we were able to improve the residents' understanding of SBP.

In 1998, the Accreditation Council for Graduate Medical Education (ACGME) began its Outcome Project, which required that US graduate medical education programs develop core curriculums, implement training, and assess competency in 6 domains: patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism, and systems-based practice (SBP).[1] The objective of attaining these 6 competencies was to create patient-focused physicians who would be able to practice in medicine within current and evolving health care systems. The teaching of patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, and professionalism are easily achieved in a general surgical residency program through direct observation of attending interactions with patients, operating room teaching, didactic lectures, surgical grand rounds, and morbidity and mortality conference. Assessment of these competencies is included in our resident evaluations completed by attending surgeons and ancillary staff.

SBP is defined as "an awareness of and responsiveness to the larger context and system of health care and the ability to call effectively on other resources in the system to provide optimal health care." As a principle, it permeates every phase of patient care including the outpatient, inpatient, and perioperative arena. However, the teaching and assessment of SBP have been more difficult as it is a

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core competency that is not well understood by residents or attending staff. Because this was a difficult topic to give a didactic lecture on, the methodology we chose to employ to teach the concepts was an educational game.

Using educational games has been a valid method for teaching in medicine. A 2010 survey of program directors in family medicine and internal medicine residencies found that 92% favored using games as a teaching tool and that 80% were already using them.[2] Akl et al[3] used a television game format to teach internal medicine residents' clinical practice guidelines. They identified that gaming was feasible for teaching and that residents enjoyed learning in this format and felt more engaged than in a didactic lecture. Another study by Webb et al[4] used the popular game show Jeopardy! to teach surgical residents about geriatrics. Other active learning techniques such as case-based discussions and problem-based learning were used to teach nongeriatric topics. Comparing the pretest and post-test for the topic of geriatrics, there was a statistically significant increase in retained knowledge as the average score increased from 51.5% to 82.6%. Although there was no difference noted in the delayed post-test scores of geriatrics vs nongeriatric topics, resident satisfaction was noted to be higher with the gaming sessions. Kerfoot and Baker[5] used an online educational game as a means for teaching core topics to urology residents. They found it to be an effective method for learning and validated their findings by comparing the game scores to resident in-service examination scores. Similar to other studies, resident satisfaction was high. Of the residents who completed the end-of-program survey, 99.6% (667 of 670 respondents) said they would be willing to participate again in a program using the game format.

We chose to use a team-based competition game model as it has previously been successful with our residents. Using surgical jeopardy as a method of teaching "dry" topics had been popular and repeated yearly for basic science topics by resident request. The rationale behind this training exercise was to teach the core concepts of SBP to the residents and to improve their understanding of this competency.

Methods

A mandatory conference is held once a week for the general surgery residents in our program. Residents are excused from conference when they are on vacation, on the surgical service at an affiliated site that is 20 miles away from our primary hospital, or when involved in emergency patient care. Before the start of one of the conferences, the residents in attendance were given a written pretest evaluating their knowledge of the SBP and its components. During the following week, all the residents participated in a didactic lecture on SBP provided on the ACGME Web site. At the completion of the lecture, the residents were divided into teams based on their residency year, and each team was assigned a "task" to solve for the residency program. The tasks were how to improve attending feedback on the floors and in the operating room (post graduate year [PGY]-5 class), how to build an effective journal club (PGY-4 class), how to best integrate medical students into the surgical rotation (PGY-3 class), how to improve simulation training in residency (PGY-2 class), and how to create an effective reading club (PGY-1 class).

Each team had to prove that their proposal best fulfilled the 6 expectations of SBP within the framework of the program. These expectations were (1) working effectively in various health care delivery systems and systems relevant to their clinical specialty: the residents had to demonstrate that their proposal could be implemented at the university hospital, the county hospital, and the community hospital comprising the program; (2) *co-ordinating patient care within the health care system relevant to their clinical specialty*: the residents were asked to identify how their proposal improved patient care co-ordination and how it could be demonstrated at the 3 different hospitals; (3) incorporate considerations of cost awareness and risk-benefit analysis in patient and/or population-based care as appropriate: each proposal had to be considered cost effective and achievable at any of their rotation sites; (4) *advocate for quality patient care and optimal patient care systems*: the residents were asked to identify how their proposal would improve patient care and quality of care; (5) *work in interprofessional teams to enhance patient safety and improve patient care quality:* the proposal had to involve other professional caregivers; and (6) *participate in identifying system errors and implementing potential systems solutions:* the residents were asked to consider possible failures for their proposal and to identify potential solutions for each failure.[6] The individual teams were given 6 weeks to develop a plan. Each team selected 2 representatives to present their idea at a departmental conference where attending faculty surgeons provided critique and selected the best resident team proposal.

Faculty members individually scored the teams on a scale of 1 (least successful) to 5 (most successful) according to how well their proposal addressed each of the 6 components of SBP. Each proposal was also scored on a scale of 1 to 5 for best idea. The highest score each team could receive from an attending was 35.

Eight weeks after the didactic lecture on SPB, the residents at weekly conference were given a written post-test on SBP.

Results

Our general surgery program has 40 categorical residents and 18 preliminary residents. There were 27 residents who participated in both the pretest and post-test. Residents who were not able to participate in both the pre-test and post-test were excluded from the analysis. In the pretest, 9 of 27 (33%) residents felt they had a good understanding of