

Quality Improvement Educational Practices in Pediatric Residency Programs: Survey of Pediatric Program Directors

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ABSTRACT

BACKGROUND: The Accreditation Council for Graduate Medical Education requires residents to learn quality improvement (QI) methods to analyze, change, and improve their practice. Little is known about how pediatric residency programs design, implement, and evaluate QI curricula to achieve this goal. We sought to describe current QI educational practices, evaluation methods, and program director perceptions through a national survey.

METHODS: A survey of QI curricula was developed, pilot tested, approved by the Association of Pediatric Program Directors (APPD), and distributed to pediatric program directors. Descriptive statistics were used to analyze the data.

RESULTS: The response rate was 53% (104 of 197). Most respondents reported presence of a QI curriculum (85%, 88 of 104), including didactic sessions (83%) and resident QI projects (88%). Continuous process improvement was the most common methodology addressed (65%). The most frequent topics taught were “Making a Case for QI” (68%), “PDSA [plan–do–study–act] Cycles” (66%), and “Measurement in QI” (60%). Projects were most frequently designed to improve clinical care (90%), hospital operations (65%), and the residency (61%). Only 35% evaluated patient outcomes, and 17% had no formal evaluation. Programs had a mean of 6 faculty members (standard deviation

4.4, range 2–20) involved in teaching residents QI. Programs with more faculty involved were more likely to have had a resident submit an abstract to a professional meeting about their QI project (<5 faculty, 38%; 5–9, 64%; >9, 92%; $P = .003$). Barriers to teaching QI included time (66%), funding constraints (39%), and absent local QI expertise (33%). Most PPDs (65%) believed that resident input in hospital QI was important, but only 24% reported resident involvement. Critical factors for success included an experiential component (56%) and faculty with QI expertise (50%).

CONCLUSIONS: QI curricular practices vary greatly across pediatric residency programs. Although pediatric residency programs commit a fair number of resources to QI education and believe that resident involvement in QI is important, fundamental QI topics are overlooked in many programs, and evaluation of existing curricula is limited. Success as perceived by pediatric program directors appears to be related to the inclusion of a QI project and the availability of faculty mentors.

KEYWORDS: curriculum development; quality improvement; resident education

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WHAT'S NEW

There is great variability in the design, content, and evaluation of quality improvement (QI) curricula in pediatric residency programs. Most QI curricula integrate didactic learning with QI project work. Pediatric program directors are not satisfied with the current state of QI education and recognize room for improvement in QI curricula.

OVER A DECADE ago, 2 Institute of Medicine reports changed the health care system and medical education. *To Err Is Human*¹ shed light on the frequency and human cost of medical errors, while *Crossing the Quality Chasm*² laid the foundation for improvement of the health care system. Educational accrediting bodies soon followed,

and in 2002, the Accreditation Council for Graduate Medical Education (ACGME) Outcome Project was launched. Core competencies were defined to guide curriculum development and performance assessment activities for residency training programs with the intent of positively impacting patient outcomes. Two of these competencies are Practice-Based Learning and Improvement and Systems-Based Practice.³ The ACGME also emphasized the importance of teaching quality improvement (QI) through experiential learning and resident engagement in a QI project.³ Pointing to the increased interdependence among practitioners and the system within which they work, Berwick and Finkelstein compared the need for QI education and system level thinking today to the need for standardized medical curricula at the time of Flexner's report in 1910.⁴

Despite the recognized importance of teaching QI to trainees, best practices in QI education have not been solidly established. The literature discussing QI curricula consists of several systematic reviews or review articles,⁵⁻⁷ as well as other articles specific to individual program curricula.⁸⁻¹¹ Several common themes have emerged from these publications: the majority of QI curricula have an experiential or project-based component^{6,7}; a longitudinal curriculum that integrates into the residents' schedule is an added benefit^{12,13}; common barriers to success include lack of faculty expertise in QI methods,¹⁴ lack of institutional support for QI education, and lack of resident interest in QI¹⁵; and educational opportunities are lost when hospital-based QI projects are conducted without resident involvement.^{7,14}

Although this literature provides insight about QI teaching, little is known about how pediatric residency programs (PRPs) teach QI to residents nationally. To close this knowledge gap, we surveyed all pediatric program directors (PPDs) in the United States with support from the Association of Pediatric Program Directors (APPD) to define the structure, content, evaluation methods, and outcomes of QI curricula in PRPs. This needs assessment is an important initial step in defining common curricular elements necessary for teaching QI to residents.

METHODS

An online questionnaire that focused on QI educational practices in pediatric residency training programs was developed by 2 of the authors (KJM, JMM). The questionnaire targeted 4 curricular domains: 1) curricular design and content, 2) curriculum support, 3) program evaluation, and 4) PPD perspectives. The original draft of the questionnaire was tested with several experts in QI and education, revised on the basis of their feedback, and sent to the APPD Research Task Force for approval. After making further modifications suggested by the Research Task Force, a 46-question survey with skip logic (skip logic, also known as conventional branching, helps direct an individual to the most appropriate set of questions in the survey on the basis of an individual question response) was distributed via the APPD electronic mailing list between September and October 2011 with a link to the survey on SurveyMonkey (<http://www.surveymonkey.com/>). Questionnaires were sent to 197 PRP directors who were members of the APPD. PPDs were asked to collaborate with colleagues at their institution within graduate medical education and QI to best complete the survey. We excluded pediatric fellowship PPDs, medicine-PRP directors, and associate PPDs to avoid duplicate responses from the same institution.

Potential respondents were contacted a maximum of 4 times via e-mail. Voluntary participation, anonymity of responses, and the right of refusal to answer any question were fully explained in all e-mails and within the survey itself. No gift or reward was offered as an incentive.

Demographic questions included PRP size as well as association with a freestanding children's hospital. These

Table 1. Sample Survey Questions by Domain

Domain	Question	Answers
Curricular Design and Content	Which, if any, QI tools are taught to the residents in the didactic component? (please check all that apply)	<ul style="list-style-type: none"> • Driver diagrams • Conceptual flow diagrams • Fishbone diagrams • Spaghetti diagrams • Pareto diagrams • Checklists • 5 Whys • None • Other
Curriculum Support	Are there dedicated support staff to help residents with their QI projects?(please check all that apply)	<ul style="list-style-type: none"> • No support staff • Non-clinical QI experts • RN QI experts • Data analysts • Research assistants • Other
Program Evaluation	Do you score or grade resident QI projects?	Yes (please describe) No
Program Director Perspectives	How satisfied are you with the QI curriculum you have in place?	Likert scale: 1 (extremely satisfied) to 5 (not satisfied)

QI = quality improvement.

questions were specifically included because we hypothesized that resource allocation may vary on the basis of these factors. Specific questions regarding the 4 topic areas followed. A sample of survey questions is included in Table 1.

Survey data were analyzed by SPSS v18 software (IBM, Armonk, NY). Descriptive statistics were summarized as percentages. To determine percentages for specific curricular elements, the denominator for each set of questions was determined by the number of respondents who had that element in place. For example, the denominator for questions pertaining to the overall curriculum includes all respondents, while the denominator for questions about QI projects includes only those programs that have QI projects as part of their curriculum. Frequencies and chi-square tests were used to assess associations between demographic variables, curricular support, abstract submission, and curricular satisfaction. A *P* value of <.05 was considered significant in all statistical analyses.

The Boston University School of Medicine and the Children's Mercy Hospital Pediatric Institutional Review Boards reviewed and approved the study as exempt.

RESULTS

The response rate was 53% (104 of 197). A QI educational program was present in 85% (88 of 104) of residency programs that responded. Table 2 summarizes the demographic data.

When asked what calendar year the QI educational program was implemented, responses indicated a slow but steady adoption since 2005 of QI education into pediatric training programs (Fig. 1).

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