A Novel Approach for Needs Assessment to Build Global Orthopedic Surgical Capacity in a Low-Income Country

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OBJECTIVE: Visiting surgical teams are a vital aspect of capacity-building continuing medical education (CME) in low-income countries like Haiti. Imperfect understanding of the genuine needs of local surgeons limit CME initiatives. Previous paper-based needs assessment efforts have been unsuccessful because of low response rates. We explored using an electronic audience response system (ARS) during a Haitian CME conference to improve the response rates and better assess needs.

METHODS: Data were prospectively collected using an ARS from 78 conference participants (57 Haitian and 21 foreign) about current and desired knowledge of 7 topic and 8 skill areas using a 5-point Likert scale presented in English and in French. The response rates using ARS vs a similar paper survey were compared using a 2-sample test of proportions. The current and desired knowledge levels were compared using paired *t* tests. Analysis of variance and post hoc unpaired *t* tests were used to compare between demographic groups.

RESULTS: The response rates were significantly greater for ARS vs a paper survey (87.7 vs 63.2%, $p = 0.002$). The 4 areas of least self-confidence for Haitians were pelvic and articular injury, joint dislocation, and osteomyelitis. The 4 skills of least self-confidence for Haitians were arthroscopy, open reduction and internal fixation-plate, external fixation, and fasciotomy. Haitians desired improvements in knowledge and management of articular, diaphyseal, and pelvic injury, joint dislocation, and osteomyelitis to a greater extent than foreigners ($p < 0.05$). Participants who previously attended the conference on open fractures felt more knowledgeable about open fractures as a topic ($p < 0.05$), but not in its management.

CONCLUSIONS: We are the first to show that an ARS improves response rates to allow for better characterization of surgeon needs in the developing world. We also demonstrate the importance of skill building paired with topic area teaching. Lastly, we show how a CME conference is an effective tool to build surgical capacity and increase confidence level. (J Surg 72:e2-e8. © 2015 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: continuing medical education, orthopedic surgery, professional development, education technology, global health

COMPETENCIES: Medical Knowledge, Practice-Based Learning and Improvement, Systems-Based Practice

INTRODUCTION

Continuing medical education (CME) is an important part of capacity building in surgery, especially in the developing world. Learning in CME activities is more likely to lead to change in practice when needs assessment has been implemented.[1] Orthopedic trauma, which is one of the essential surgical care needs in the developing world, has become a necessity. In the latest global burden of disease, road traffic injuries are ranked 10th among the leading causes of disability-adjusted life-years lost, a trend with no sign of slowing down with motorization of the roads in the developing world. These nations account for 90% of this disability-adjusted life-years lost.[2]

Close attention to competency and skills while promoting capacity building in orthopedics in the developing world is

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critical, as these efforts are likely to alter surgeon practice and patient satisfaction.[3] In the developing world, postgraduate medical, and especially surgical, education relies greatly on visiting professors from developed countries to supplement medical knowledge and skills. However, this transfer of knowledge can be very sporadic owing to a lack of longitudinal implementation of these visits. Furthermore, the irregularity of these visits may create an imbalance in surgical knowledge even within the same country.

CME is defined as educational activities that serve to maintain, develop, or increase the knowledge, skills, performance, and relationships that a physician uses to provide services for patients, the public, or the profession.[4] The Haitian Annual Assembly for Orthopaedic Trauma (HAAOT) is the first orthopedic-focused CME conference designed for Haitians to provide a platform for postgraduate education. One of the challenges in the design of HAAOT's CME curriculum is the lack of any documented data on the needs of Haitian orthopedic surgeons and residents. A needs assessment can explore felt needs (what people say they need), expressed needs (expressed in action), normative needs (defined by experts), and comparative needs (group comparison),[5] but we were interested on "felt needs" as adult learners are best reached when their "felt needs" are addressed.[6] This focus also helps to identify appropriate areas for improvement in skills, knowledge, and attitudes by identifying gaps to be filled.[7]

Even when needs assessment is recognized as important, efforts often fail or are made challenging, as the response rates to paper or online surveys are very poor.[7,8] As HAAOT brings all the 3 orthopedic residency programs and most practicing orthopedic surgeons in the country together in 1 place, we sought to determine whether the use of an audience response system (ARS) could boost the response rate and provide a more accurate needs assessment. In addition to exploring the use of ARS for needs assessment, the results of our study help address 2 main concerns of postgraduate orthopedic education: (1) the current level of knowledge and skill competency and (2) self-identified areas for improvement that can be the focus of future CME efforts during conferences and trips by visiting surgeon educators.

MATERIALS AND METHODS

Setting

The HAAOT was created in 2013 to address a very fundamental need in postgraduate training, continuing education, which at the time did not exist. The conference consists of original research paper presentations, case discussions by Haitian residents, and didactic lectures presented by foreign visiting attending surgeons on relevant topics in orthopedic trauma.

Participants

Survey participants included Haitian and foreign (United States/Ireland) orthopedic residents and attending surgeons drawn from multiple academic centers within their respective countries. Foreign residents and attending physicians were volunteers.

Electronic invitations were sent to all aforementioned participants and more specifically to all the 3 orthopedic residency programs and most of the practicing orthopedic clinicians in the country. Of the 3 programs, 2 are located in Port-au-Prince and the other is in Cap-Haitian, which is located approximately 251 miles (156 km) north of the capital city. Practicing orthopedists came from all over the country to participate. In total, there were 89 participants at the conference when including generalists, family and emergency medicine residents, and physical therapists. However, outcomes for these groups are not reported in this study owing to small sample size.

Survey Design

Questions about current and desired competence across key orthopedic topics and skills were created as Microsoft Office PowerPoint slides that were integrated with an ARS (TurningPoint ResponseCard RF, Turning Technologies). This system uses radiofrequency to capture anonymous audience responses. Questions were distributed across the day's presentations to prevent "clicker fatigue" and queried in blocks of 5 minutes. A set of 5 demographic questions (sex, attending physician/resident, postgraduate years, prior HAAOT attendance, and hospital affiliation) was used to train participants in the use of the ARS, and all questions were projected in both English and French to account for the differing language preferences of the audience. These questions allowed us to register each response unit exclusively to a unique individual while maintaining anonymity. No technical difficulties were encountered in the use of the ARS.

The audience was asked to respond to preselected topics that were perceived as relevant and crucial to the basic practice of orthopedic trauma as determined from existing quality information data from multiple hospitals in Haiti (unpublished data). We also sought expert advice on possible extra topics necessary for a well-balanced assessment. The skills and the topics chosen were interrelated to aid in validation of the answers. We asked the audience to first evaluate their present knowledge on a topic/skill and then followed that question with the desired level they would want to achieve on that same topic/skill using a 5-point Likert scale (expert = 1 and novice = 5).

Statistical Analysis

ARS response rate was compared with the response rate of a similar paper survey distributed on the same day using a