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Education

WHAT'S THE EVIDENCE: SELF-ASSESSMENT IMPLICATIONS FOR LIFE-LONG LEARNING IN EMERGENCY MEDICINE

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☐ **Abstract—Background:** The 2012 Academic Emergency Medicine Consensus Conference, "Education Research in Emergency Medicine: Opportunities, Challenges, and Strategies for Success" noted that emergency medicine (EM) educators often rely on theory and tradition when molding their approaches to teaching and learning, and called on the EM education community to advance the teaching of our specialty through the performance and application of research in teaching and assessment methods, cognitive function, and the effects of education interventions. **Objective:** The purpose of this article was to review the research-based evidence for the effectiveness of self-assessment and to provide suggestions for its use in clinical teaching and practice in EM. **Discussion:** This article reviews hypothesis-testing research related to self-assessment behaviors and learning. Evidence indicates that self-assessment is inherently flawed when used in isolation. We review a multi-dimensional approach to informed self-assessment that can serve as the basis for life-long learning and development. **Conclusions:** Advancing EM education will require that high-quality education research results be translated into actual curricular, pedagogical, assessment, and professional development changes. The informed self-assessment framework is a method that is applicable to teaching and practice in EM. © 2017 Elsevier Inc. All rights reserved.

☐ **Keywords**—education research; self-assessment; clinical teaching; emergency medicine

ANNUAL FACULTY REVIEW

Dr. Smith (Department Chair): Dr. Young, how would you rate your ability to lead resuscitations?

Dr. Young (junior faculty): I think I am pretty good under pressure and have had a lot of experience now. So, I think I'm pretty good I guess.

Dr. Smith: I'm glad to hear those positive things, but unfortunately I have received several complaints from the nursing staff regarding your lack of leadership during codes.

Dr. Young: That's a surprise! I'm not sure who would say that because I feel like I'm in control of the room.

Dr. Smith: Well, maybe we can explore this difference in perception. What do you think you might do differently?

Dr. Young: I'm not really sure I need to do anything differently because I feel like things are going okay. But, I guess I just have to be louder? The nurses obviously have something against me.

While the clear discordance between the junior faculty member's self-assessment and the Chair's feedback may seem extreme, this case illustrates the inherent flaws associated with self-assessment and the resulting challenges of using self-assessment to learn and maintain optimal performance in medical practice. This article describes the traditional definitions and approach to

self-assessment, reviews research results that highlight the shortcomings of this approach, and advocates for the use of informed self-assessment for the purposes of growth and maintenance of performance in emergency physicians.

Self-assessment is the process through which an individual identifies the characteristics of competent practice in a given area and then applies that criteria in an assessment of their own performance (1). This process can be classified into three domains of self-assessment: predictive, summative, and concurrent (1). Predictive self-assessment refers to an individual's ability to predict how he or she will perform in a specific activity in the future, relative to an accepted performance benchmark. Summative self-assessment occurs when an individual rates his or her recent performance after having completed an activity. Concurrent self-assessment is the ability of an individual to self-identify gaps in performance and related learning needs, while in the process of performing an activity.

Across all levels of medical training and practice, it is assumed that physicians regularly perform all three aspects of self-assessment to identify areas of strength and weakness in order to inform continuous improvement. The traditional view of self-assessment is often conceptualized as a "personal, unguided reflection on performance for the purposes of generating an individually derived summary of one's own level of knowledge, skill, and understanding in a particular area" (2). This definition of self-assessment is often applied as the basis for the practice-based learning and performance improvement competency in post-graduate training, many faculty performance reviews, continuing medical education programs, and maintenance of certification requirements. The achievement of the practice-based learning and improvement competency and professional development programs presumes that physicians have insight into their actual performance and possess the ability to accurately conduct regular self-assessments in order to identify areas of weakness on which to base continued self-improvement (3).

Unfortunately, research demonstrates the inability of individuals to independently and accurately assess their performance or identify areas of weakness in order to focus further development efforts (1,4−7). Despite the challenges that this research implies, self-assessment and self-monitoring are often crucial determinants in the acquisition of new skills and the maintenance of performance. The capacity to seek performance-related information, recognize performance gaps through informed self-assessment, and address deficits is the basis of life-long learning for clinicians (8). This brief article reviews the relevant research evidence and provides tips for the use of self-assessment in emergency medicine (EM).

SEARCH STRATEGY AND EVIDENCE SELECTION

A PubMed search for English-language articles was performed using the following search terms: *self-assessment* AND *medical education.* There were 1113 articles identified. Abstracts were then reviewed to identify articles with hypothesis-testing research or clinical relevance (n = 28). We identified three with excellent educational research methodology and a high number of citations (35 to 1242) with application to EM practice.

Kruger J, Dunning D. Unskilled and unaware of it: how difficulties in recognizing one's own incompetence lead to inflated self-assessments. J Perspect Soc Psychol 1999;77:1121−34

The limitations of self-assessment were illustrated in a series of controlled experiments by Kruger and Dunning (9). These experiments assessed participants' abilities in the domains of humor, logical reasoning, and English grammar, and then compared their actual performance to their self-assessment of that performance. The research demonstrated that study participants consistently miscalibrated their performance in telling a joke, reasoning through a logic puzzle, and correcting English grammar (Figure 1). The lowest-performing participants generally believed they were performing above average and were unable to recalibrate their self-assessment perspective, even after comparing their actual performance to that of high-performing peers. Only after receiving training for the task at hand were participants able to more accurately calibrate their performance assessments. In contrast, high-performing subjects tended to under-rate their performance, but were able to more accurately assess their performance after comparing themselves to their peers. The results of these experiments underscore the inaccuracy and, therefore, limited utility of independent
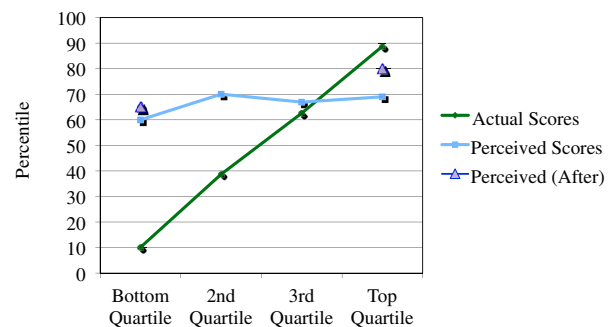

Figure 1. Perceived logical reasoning ability and test performance as a function of actual test performance. Reprinted from: Kruger J, Dunning D. Unskilled and unaware of it: how difficulties in recognizing one's own incompetence lead to inflated self-assessments. J Person Soc Psychol 1999;77:1121−34, with permission (9).