Orthopedic In-Training Examination: A Performance Review Based on Program- and Resident-Specific Characteristics

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OBJECTIVES: The orthopedic in-training examination (OITE) is the most common and objective method used to assess resident knowledge in the United States. As such, residents and programs use a number of strategies to maximize OITE performance. The purpose of this work was to better understand what strategies were being implemented and to determine which program-specific and resident-specific characteristics best correlate with improved scores.

DESIGN: A national survey of orthopedic residents and program directors (PDs) was performed to better understand OITE performance and correlate scores with various test preparation strategies.

SETTING: Mayo Clinic, Rochester, MN.

PARTICIPANTS: The survey was completed by 33 of 48 (68.8%) PDs and 341 of 878 (38.8%) eligible residents.

RESULTS: The most commonly used program-wide strategies were as follows: negative consequences for poor performance (72.7%), formal OITE prep program (54.5%), and purchase of OITE test prep material for residents (51.5%). The program-specific characteristics that had the strongest correlation with increased scores were negative consequences for poor performance (p < 0.001), high value placed on the OITE by PD and residents (p < 0.001), excusing residents from clinical duties the evening prior (p < 0.001), having residents take the examination on different days (p = 0.012), and allowing residents to lead a review course (p = 0.047). The resident-specific characteristics that correlated most with score were increased study time leading up to the test (p = 0.031) and attendance at their program's OITE prep program (p = 0.062).

CONCLUSIONS: Although programs and residents looking to improve knowledge acquisition and OITE scores use a number of techniques, a few distinct strategies correlate with the greatest increases in OITE performance. These may be appropriate methods to consider for those looking to improve their performance in coming years. (J Surg Ed 74:754-761. © 2017 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: orthopedic in-training examination, OITE, resident, education

COMPETENCIES: Medical Knowledge, Practice-Based Learning and Improvement

INTRODUCTION

Initially introduced in 1963, the orthopedic in-training examination (OITE) was the first examination of its kind to be implemented by any medical specialty.[1] Overseen by the American Academy of Orthopedic Surgeons and administered on an annual basis, the current OITE exists in an online format where residents are asked 275 questions that span a broad range of orthopedic knowledge domains.[2] The initial purpose was to allow assessment of orthopedic knowledge, evaluate quality of teaching within institutions, and permit comparisons of performance across programs.[1,3] Since that time, the OITE has become the most widely studied and emphasized objective assessment of orthopedic

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resident knowledge in the United States.[2,4-11] It provides a valuable method of knowledge appraisal for program directors (PDs) while aiding in the identification of critical deficiencies, development of targeted study programs, and need for other specific educational interventions.[4] These benefits hold true for individual residents as well as entire training programs. A multitude of studies have demonstrated the reliability of OITE performance as a predictor of subsequent performance on part I (written examination) of the American Board of Orthopedic Surgeons (ABOS) examination.[8,11-15]

Given the perceived value of this test by many educators, a number of strategies to optimize scores have been developed at the individual, institutional, and national levels. Some of the more common strategies employed by programs to improve scores include, but are not limited to, didactic OITE curricula, hands-on training courses, addition of subspecialty conferences, formal reading programs, rewards for good performance, and negative consequences for poor performance.[4,5,7,14,16-18] Many of these strategies, such as formal curricula, regular conferences, and reading programs, have produced positive effects on OITE performance.[16-18] For individual residents, regular review of current literature, scheduled reading programs, group study, reading of appropriate review texts, use of online OITE practice websites, and review of previous years' OITE examinations have all demonstrated some benefit.[5,6,9,18]

Despite the tremendous progress that has been made in recent years, the most effective means of improving resident knowledge and OITE performance remains unknown. Although the answer to this question is quite complex and likely varies from program to program and resident to resident, additional study of these strategies is warranted. The purpose of this work was to better understand the current climate of OITE preparation strategies employed by US residents and training programs. Specifically, we sought to (1) better understand the frequency with which training programs were using various OITE preparation strategies, (2) determine the program-specific characteristics that correlated with superior OITE scores, and (3) identify resident-specific characteristics that best correlate with OITE performance.

MATERIALS AND METHODS

After seeking an approval from the institutional review board, experienced orthopedic residency educators from the 3 participating institutions (Mayo Clinic, Hospital for Special Surgery, and the University of Iowa) identified a list of what they felt to represent key factors that influence resident performance on the OITE. These were drawn in part from previously published works; however, they also focused on contemporary questions and concerns voiced by current residents and educators across the country. After

much discussion, the final set of questions was compiled and assimilated into an electronic survey using Qualtrics Software (Qualtrics, LLC, Provo, UT). The survey was disseminated through e-mail to US orthopedic surgery residency program coordinators (PCs) who were identified through an online search. PCs were asked to forward the link to their residents and program directors. Overall, 2 reminders were sent out at 3-week intervals. After 10 weeks of initial request, the survey was closed. All responses were anonymous and void of identifying information. To determine response rates, PCs were asked if they sent the link to the PDs and residents, and how many residents were in their program. To maximize recall, the survey was sent out the week following administration of the 2015 OITE.

For PDs, the survey focused on program-specific characteristics. PDs were also asked how many residents were in their program and what the mean 2014 year-in-training OITE percentile score (comparison of resident performance to other residents of the same postgraduate year) was for their residents. Residents were asked questions that paralleled those of the program director but were focused on individual characteristics. They were also asked to self-report year-in-training scores for each year.

Statistical Analysis

For analysis of program-specific characteristics, the responses of the program directors were compared with one another, as these questions focused primarily on attributes that applied to all residents in that program. To understand the frequency with which various OITE performance improvement strategies were used (purpose #1), PD responses were directly compared with one another with equal weighting as each response represented a single program. For comparison of OITE performance based on program-specific characteristics (purpose #2), the mean OITE score for each institution was weighted based on the number of residents that the institution represented. This allowed more reliable and balanced comparison of large and small programs. For analysis of resident-specific attributes that correlated with OITE performance (purpose #3), only residents who had taken the OITE and received their score(s) (postgraduate years [PGY] 2-5) were included in the analysis. For residents with multiple years of OITE results (PGY 3-5), their OITE scores for each year were averaged and this mean was used in the analysis.

For frequent use of OITE performance improvement strategies, results are reported using descriptive statistics (number, frequency, and percentage) where indicated. Comparisons of mean OITE scores between 2 groups defined by dichotomous variables (yes or no questions, agree or disagree, marital status, etc.), were performed with a Student t-test. These are reported with mean differences (MD) and 95% CI. When comparing means of 3 or more groups of continuous variables (future career setting,