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Clinical Study

Academic productivity and contributions to the literature among spine surgery fellowship faculty

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Abstract

BACKGROUND CONTEXT: No previous study has considered academic productivity and contributions to the literature among the faculty members of spine fellowship programs.

PURPOSE: We sought to evaluate the total number of publications and measures of academic impact among faculty at spine surgical fellowship programs between 2011 and the present.

STUDY DESIGN: This study is based on a review of data publicly available on PubMed and Scopus.

PATIENT SAMPLE: Physicians listed as faculty at a spine fellowship program in the directory of the North American Spine Society (NASS).

OUTCOME MEASURES: The outcome measures were the number of publications between January 1, 2011 and August 31, 2014 and the h-index for 1996 to present (h-tot) and 2011 to present (h-pres) for faculty members.

METHODS: Fellowship programs and their characteristics were obtained from the directory of the NASS. Program-specific features, including academic affiliation, number of participating faculty, location, number of fellowship positions, dedicated research time, and presence of a research requirement for fellows, were abstracted. The number of publications for faculty at each program between January 1, 2011 and August 31, 2014 and the h-tot and h-pres were obtained from Scopus. Multivariable linear regression was used to identify statistically significant factors associated with increased academic productivity.

RESULTS: Among 75 fellowship programs, with 282 faculty members, there were 55 (73%) with academic affiliation. The average number of publications per faculty member (2011–2014) was 5.5 (standard deviation, 8.4; range, 0–54). The mean h-tot for programs was 13.6 (8.7, 0–37), and mean h-pres was 3.0 (2.2, 0–8.2). Academic affiliation (regression coefficient, 22.1; 95% confidence interval: 7.2, 37.0), and the number of fellows in a program (7.0, 0.9–13.2) was significantly associated with the total number of publications. Similar findings were encountered for average h-tot and h-pres.

CONCLUSIONS: The descriptive statistics presented can help surgeons benchmark their performance and that of their fellowship, compared with others in the field. Determinations regarding characteristics associated with academic productivity may also help programs' fashion future strategic initiatives.

Keywords: Fellowship training; Graduate medical education; Academic medical centers; Spine surgery; Publication rates; Medical journals

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Introduction

Spine surgery fellowship programs maintain the important role of educating and training prospective surgeons who wish to join the subspecialty. Commensurate with this charge, it is generally assumed that fellowships provide experiential opportunities in the operative and nonoperative management of common spinal disorders. To varying degrees, exposure to the administrative requirements of practice, opportunities for professional development, and spine surgical research are also anticipated. Although it is recognized that many programs will not produce scientific articles in high volumes, exposure to research processes during fellowship training is necessary, if only to facilitate fellows becoming ''educated consumers'' of the spine literature. Although such skills are clearly valuable in the age of continuing medical education and maintenance of certification, they seem especially important in light of the current emphasis on evidence-based practice.

Commensurate with the prominence of health-care rankings in the popular media [1], a desire among scholars to grade performance and productivity within surgical disciplines has also become apparent [2–6]. Such measures focus primarily on academic attributes in terms of the number of articles published, number of trainees working in academic medicine, impact factor (IF) of publications, and Hirsch (h) index [2–6]. This is in contrast with *US News & World Report* and ratings that consider factors often tangential to graduate medical education (e.g., nurse staffing ratios, physician opinion, and use of clinically proven technologies) [1,7]. Although familiar to some, the latter two metrics warrant further explanation. Journal IFs, released by Thomson-Reuters for nearly four decades, reflect the importance of the journal in which an article is published by presenting the average number of citations received by articles in that journal [8]. The h-index, introduced more recently [9], has gained wide currency in academic medicine and other fields as an objective measure of an individual's research productivity and impact [2–5]. Calculation of the h-index takes into account an author's total number of published articles along with the number of citations attributable to each publication [9]. These indices are potentially valuable as they can help surgeons benchmark personal productivity and that of their respective training programs, compared with others in the same field.

To the best of our knowledge, no investigation has previously considered academic productivity and contributions to the literature among faculty members at spine fellowship programs. In this context, we sought to develop an overview, evaluating academic productivity among spine surgical faculty in the United States and Canada over recent years. As a primary measure, we intended to describe the contexts in which scientific literature is produced by spine faculty and identify factors associated with increased research productivity. Second, we sought to delineate factors associated with higher academic impact as determined by the h-index.

Methods

Data collection

The spine surgical fellowship programs considered in this study and their characteristics were obtained from the Spine Fellowship Directory of the North American Spine Society (NASS) [10]. The directory used was that made available through the NASS Web site and maintained as current on August 31, 2014. Program-specific features that were abstracted included the names of participating faculty, fellowship location(s), number of fellowship positions per year, fellowship salary, percent of fellowship time dedicated to operating, dedicated research time, presence of a research requirement for the program, and assignment of formal teaching responsibilities to fellows. Presence of a research requirement was determined by whether the fellowship reported to NASS that fellows were expected to conduct one or more projects during their time in training.

The Scopus database (Elsevier BV, Waltham, MA, USA) [11] was subsequently queried to obtain the number of faculty-specific publications from January 1, 2011 to August 31, 2014. The Scopus search engine maintains the largest repository of citation tracking for the peer-reviewed scientific literature. Scopus was also used to obtain the cumulative h-index limited to the time period 1996 to present (h-tot) and an h-index from 2011 to present (h-pres) for individual faculty members. The IF of each publication's journal was then abstracted based on the most recent report available from Thomson-Reuters [8]. In the event that a journal did not have an IF listed by Thomson-Reuters, the publication was assigned an IF of zero. In an effort to ensure that publications were representative of research conducted primarily by the faculty member, and to limit the possibility of duplicate assignation, articles were accredited to faculty members only when that individual was listed as the first or senior author on the study. Faculty-specific metrics were accrued to develop measures for their respective fellowship programs as a whole, which are reported in aggregate to respect confidentiality.

Fellowship programs were characterized as academic, or nonacademic, based on an established institutional relationship with a colocated American medical school for the entire time period under study. Fellowships were also assigned to one of seven regions based on their location: Northeast, Southeast, Midwest, Southwest, Mountain, Pacific, and Canada. Assignments were made and reviewed for accuracy by four authors (AJS, AB, JG, and CMB) with disagreement resolved through mutual consensus. All determinations regarding number of publications and h-indices were finalized on August 31, 2014.

Statistical analyses

The total number of faculty publications (2011–2014), h-tot and h-pres for faculty and fellowships, served as the outcomes of interest. Outcomes were analyzed as continuous variables with the following covariates serving as possible