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Does industry funding mean more publications for subspecialty academic plastic surgeons?

Qing Zhao Ruan, MD,[a] *Justin B. Cohen, MD, MHS,*[a] *Yoonji Baek,*[b] *Patrick Bletsis,*[a] *Arthur R. Celestin, MD, MPH,*[a] *Sherise Epstein, MPH,*[c] *Alexandra E.M. Bucknor, MBBS, MRCS, MSc,*[a] *and Bernard T. Lee, MD, MBA, MPH*[a,*]

[a] *Division of Plastic and Reconstructive Surgery, Department of Surgery, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, Massachusetts*

[b] *Massachusetts College of Pharmacy and Health Sciences, Boston, Massachusetts*

[c] *Harvard T.H. Chan School of Public Health, Boston, Massachusetts*

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ABSTRACT

Background: Conflict of interest among physicians in the context of private industry funding led to the introduction of the Physician Payments Sunshine Act in 2010. This study examined whether private industry funding correlated with scholarly productivity in the respective subspecialties of plastic surgery and the wider academic plastic surgery community.

Materials and methods: Full-time plastic surgeons and their academic attributes were identified via institutional websites. Fellowship-trained individuals were segregated into subspecialties of microsurgery, craniofacial surgery, hand surgery, esthetic surgery, and burn surgery. The Center for Medicare and Medicaid Services Open Payment database was used to extract industry funding information. Each individual's bibliometric data were then collected through Scopus to determine the correlation between selected surgeon characteristics, academic productivity, and industry funding.

Results: Nine hundred and thirty-five academic plastic surgeons were identified, with 532 having defined subspecialty training. Academic bibliometrics among subspecialty surgeons were comparable among the five groups with esthetic and craniofacial surgeons displaying a preponderance of attaining more industry funding ($P = 0.043$) and career publications respectively, with the latter not attaining statistical significance ($P = 0.12$). Overall, research-specific funding ($P = 0.014$) and higher funding amounts ($P < 0.0001$) correlated with higher Hirsch indices in tandem with higher academic rank. A funding level of $2000 appeared to be the approximate cutoff above which scholastic productivity became apparent.

Conclusions: Our study demonstrated in detail the association between industry funding and academic bibliometrics in academic plastic surgery of every subspecialty. Even at modest amounts, industry support, especially when research designated, positively influenced research and therefore, academic output.

* *Corresponding author*. Division of Plastic and Reconstructive Surgery, Department of Surgery, Beth Israel Deaconess Medical Center, 110 Francis St., Suite 5A, Boston, MA 02215. Tel.: +1 617 632 7835; fax: +1 617 632 7840.
E-mail address: blee3@bidmc.harvard.edu (B.T. Lee).

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Introduction

A delicate relationship exists between the scientific community and its funding sources. Significant resources are required to engage in basic scientific research and its clinical translation.[1] Private industry is oftentimes the only candidate capable of making such investments. As a result, academic researchers bear the burden of accountability to multiple parties, each with its own agendas and goals.[2]

Academic researchers may experience clear conflicts of interest when working on privately funded projects, and this topic has gained attention in recent years.[3,4] The introduction of the Physician Payments Sunshine Act was an attempt to alleviate concerns by publically publishing all financial transactions between clinicians and industry. This forced disclosure elucidated the pervasiveness of these financial relationships. It was truly eye-opening, and journal editors took notice and responded by making financial disclosures a mandatory component of almost all published work.[5,6] As other countries have shown,[7] despite the potential for bias, many of the advancements in medicine would not have been possible without appropriate financial backing from industry.

The link between federal grant acquisition and scholarly output has been well established in a number of surgical disciplines.[8-11] To this end, the Hirsch index (h-index) has recently been popularized and adopted as a scholastic output measure in a variety of surgical specialties with fairly congruent results.[12-14] We seek to ascertain if private industry funding serves a similar purpose in plastic and reconstructive surgery and its subspecialties of microsurgery, craniofacial, hand, esthetic, and burn surgery, associating with scholarly productivity in academic clinicians.

Materials and methods

This study was exempt from Institutional Review Board approval due to all accessed information being public and involving no human subjects. The American Medical Association's Fellowship and Residency Electronic Interactive Database Access System[15] was accessed, and a list of plastic surgery residency training programs, both integrated (72) and independent (67), was acquired. Collectively, the two separate searches yielded a total of 97 unique institutions, and each of their websites was accessed for faculty listings. Only full-time academic faculty listed on the program websites were included in our study. Faculty member demographics included were as follow: age, gender, departmental appointment (chair/chief of division, faculty member), academic rank (instructor, assistant professor, associate professor, professor, endowed professor), Fellow of the American College of Surgeons membership, and fellowship subspecialty training (microsurgery, craniofacial surgery, hand surgery, esthetic surgery, and burn surgery).

For each plastic surgery faculty member, bibliometric data were extracted from Scopus (www.scopus.com)[16] as a measure of scholarly activity. This specifically included the h-index, h5-index, total publications, and total citations. The h-index serves as a useful measure for the academic scholar because the formula takes into account not only the total number of publications but also the impact of these publications. The impact of each publication is measured by the number of times an article is subsequently cited. The h-index helps to establish a balance between being prolific and highly relevant. As an extension of the h-index, the h5-index is the reflection of scholarly productivity over the most recent 5 years.

Our exploration of industry funding to individual faculty members was performed through the Center for Medicare and Medicaid Services Open Payment database (www.cms.gov).[17] This database (made accessible via the Physician Payment Sunshine Act) is updated annually, allowing free public access to information on funding and payments from industries to the medical community. Data on each faculty member's payments paralleled the funding categories shown on the database: general (payment unrelated to research including payments for consultation, education, and honoraria for formal speeches), research (payment associated with research work), associated research (payment associated with research work where clinician is principal investigator), and ownership (investment and ownership in companies). We also performed a summation of the four categories to derive what we termed "total industry payment." Since 2015 is the year with the most updated database, we chose this time point as the foundation of our study.

Statistical analysis

For statistical comparisons of continuous variables, paired t-test and analysis of variance were adopted as tools for calculation, whereas chi-squared test was used for the analysis of categorical data. P-value <0.05 was defined as statistically significant. We performed a specific calculation using the aforementioned methods in determining the funding threshold, above which academic bibliometrics exponentially increase. This was conducted via chi-squared analyses of academic bibliometrics (h-index, h5-index, citations, and publications) between different funding amounts grouped in pairs reflected as above or below a predetermined value ranging from unfunded to $50,000. We started with the unfunded ($0) surgeons and made $500 increments each time, regrouping them and recalculating the difference in mean bibliometrics between the groups above and below the defined funding amount. All calculations were conducted using GraphPad Prism (GraphPad Software Inc, San Diego, CA).

Results

Through our preliminary data extraction, 935 academic plastic surgeons were identified via the search protocol, and demographics were displayed in Table 1. In 2015, 726 (77.6%) received industry funding as reported on the open access domain (Fig. 1). Five hundred and thirty-two of the total underwent clearly defined fellowship training with 120 in microsurgery, 140 in craniofacial surgery, 175 in hand surgery, 49 in esthetic surgery, and 20 in burn surgery (Table 2). Twenty-eight had more than one fellowship training registered.