Academic Orthopedists Trained at "Top 20" Residency Programs Have Higher Scholarly Productivity and Industry Funding in Their Careers

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INTRODUCTION: Doximity, an online networking service for medical professionals, has a multifactorial ranking system for orthopedic residency programs. The impact of attending a top-rated residency program on academic productivity has been documented in other specialties. To our knowledge, no studies of this nature exist in the field of orthopedics. The purpose of this cross-sectional study is to explore the effect of residency training on future academic productivity and funding.

METHODS: Academic orthopedic programs in the United States were identified using the Fellowship and Residency Electronic Interactive Database (FREIDA). Available demographic and training data for surgeons was collected from institutional websites and Doximity. Relative citation ratio (RCR) was calculated using the NIH iCite tool and Hirsch index (h-index) was calculated using Scopus. H-index equals the number of publications for which an author has been cited at least that same number of times. RCR equals citations of a publication, normalized to the citations received by NIH-funded publications in the same field and year. Mean RCR (m-RCR) is the average of RCR scores and assesses impact, while weighted RCR (w-RCR) is the sum of all RCR scores and assesses productivity. Doximity was used to rank residency programs by “reputation”, which is calculated using annual surveys of current and recent residents who select their top five programs. Programs were categorized as either Top 20 (T20) or not Top 20. General payments and number of payments were collected from the Centers for Medicare & Medicaid Services Open Payments Program for all available years (2014-2020). Average payment was calculated by dividing the total CMS general payment amount by the total number of payments. Statistical analyses were conducted using IBM SPSS Version 25 and SAS Studio 3.8.

RESULTS:

Of 2,726 orthopedists identified from 122 residency programs, 838 (30.74%) completed residency training at a T20 program. Of the T20 programs, 6 (30%), 5 (25%), 5 (25%), and 4 (20%) were in the Northeast, Midwest, West, and South, respectively. Among the academic orthopedists who had trained at T20 vs non-T20 programs, there was a difference in h-index ($\bar{x}$ = 18.57 vs. 12.02, $p < 0.001$), m-RCR ($\bar{x}$ = 1.99 vs. 1.75, $p = 0.0010$), w-RCR ($\bar{x}$ = 81.34 vs. 46.53, $p < 0.001$), total number of publications ($\bar{x}$ = 80.84 vs. 41.94, $p < 0.001$), and total number of citations ($\bar{x}$ = 2,158.39 vs. 1,090.89, $p < 0.001$). There was no difference in years in practice or number of fellowships. There was a difference in distribution of academic rank; those who trained at T20 programs were 1.415 [CI: 1.183-1.692] times more likely to obtain professor status than those that did not train at T20 programs, $p < 0.001$). There was a difference in CMS general payments ($\bar{x}$ = $260,834.06 vs. $121,208.59, $p < 0.001$) and average payment size ($\bar{x}$ = $1,909.33 vs. $1,039.15, $p < 0.001$). There was no significant difference between the number of payments.

DISCUSSION AND CONCLUSION:

Among this cohort, T20 trained orthopedists differed from non-T20 trained orthopedists in the following areas: academic rank, total number of publications, total number of citations, h-index, m-RCR, w-RCR, and industry funding. Additionally, T20 trained orthopedists were more likely to obtain professor status. There was no significant difference in years in practice or number of fellowships. Training at a T20 residency program is a predictor of promotion, productivity, and funding.