

A 25-Year Analysis of Diversity, Equity, and Inclusion Research in Orthopaedics Shows Majority Female Authorship and Increasing Gender Parity Research

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INTRODUCTION: Orthopaedic surgery is one of the least diverse fields in medicine. In recent decades, there has been a concerted effort to increase diversity, equity, and inclusion (DEI) in the specialty. Several organizations, such as Nth Dimensions, Pride Ortho, and initiatives such as The E. Anthony Rankin Orthopaedic Scholarship have been founded to establish the pipeline for underrepresented in medicine (URM) students into orthopaedic surgery. This study aims to examine trends in orthopaedic surgery DEI research.

METHODS: A search was conducted of DEI articles in orthopaedic surgery using PubMed, MEDLINE, EMBASE, Scopus, Cumulative Index to Nursing and Allied Health Literature (CINAHL), and Education Resources Information Center (ERIC). The year of publication, article topic of focus, gender of the primary author, publishing journal, citation index, and primary contributing institution were recorded for each article. Gender of the primary author was predicted by the authors utilizing an online image search of the author and institution. Articles were excluded if the research was conducted outside of the United States (US) or if they were not specific to orthopaedic surgery. Author characteristics were compared using chi-squared and t-tests for categorical and continuous variables, respectively. Subanalysis was performed examining the articles published before the start of 2016 versus those published after the start 2016. Binary logistic regression analysis determined the likelihood of woman authorship and topic of interest after the start of 2016. In all testing, significance was established a-priori for odds ratios and 95% confidence intervals (CI) exclusive of 1.0 and $p < 0.05$. All statistical analyses were conducted using same software. Descriptive statistics were used to summarize the data as total numbers, percentages, and mean with standard deviation or median with range. Analysis was performed using same software.

RESULTS: A total of 143 articles met inclusion criteria. In total, 52.4% ($n = 75$) of authors were women and 44.1% ($n = 63$) were men. Some 42.7% of the articles were written about gender ($n=61$), 39.9% race/ethnicity and gender ($n=57$), and 11.9% race/ethnicity ($n=17$). A total of 10 articles were affiliated with Washington University in St. Louis while 51 other institutions wrote the remaining articles with none having greater than 4. Information was unable to be confirmed for 5 articles. In 2018, 5 articles were published followed by 17 in 2019, 25 in 2020, 34 in 2021, and 30 in 2022. When examining the publications from 1999-2015 ($n=22$, 19.8%) compared to 2016-current ($n=89$, 80.2%), the 2016-current had a higher mean citation index (2016-current: 6.5 vs. 1999-2015: 2.7; $p=.044$). The authors of the 2016-current publications were more likely to be women (OR: 4.0, 95% CI: [1.5-10.9]; $p=.007$). Articles from 2016-current have a greater focus only on gender than before 2016 (OR: 4.2, 95% CI: [1.3-13.4]; $p=.015$) but are less often focused on race/ethnicity compared to 1999-2015 (OR: 0.2, 95% CI: [0.1-0.6]; $p=.004$).

DISCUSSION AND CONCLUSION:

While the number of articles written since 1999 in this domain has more than quadrupled in output, there is substantial room to grow in the areas of race/ethnicity and inclusion within the specialty. Gender parity research has been heavily emphasized in the past 10-15 years and has paid exceptional dividends while research regarding race/ethnicity and inclusion has been left behind. Leading journals in orthopaedics, academic centers, and institutions should incentivize authorship and research productivity in racial/ethnic and inclusion research in orthopaedics. In turn, increasing the importance of inclusion-centered research that can develop strategic plans on the “how” behind creating inclusive and safe academic environments for minoritized groups, with the outcome of increased retention of underrepresented physicians in the specialty. Future studies should evaluate the characteristics of DEI-centered orthopaedic institutions to create a framework for other programs to adopt and utilize.

