**Gender Trends in Authorship of Spine-Related Academic Literature – A 39-Year Perspective**

**Background Context**

Despite recent advances in gender equity in medicine, the representation of women in orthopaedic and neurosurgery remains particularly low. Furthermore compared to their male colleagues female faculty members are less likely to publish research, limiting opportunities in the academic promotion process. Understanding disparities in research productivity provides insight into the “gender gap” in the spine surgeon workforce.

**Purpose:** To determine the representation and longevity of female physician-investigators among the authors of five spine-related research journals from 1978 to 2016.

**Study Design:** Retrospective bibliometric review

**Methods:** Authors of original research articles from five prominent spine-related journals (European Spine Journal, the Spine Journal, Spine, Journal of Spinal Disorders and Techniques and Journal of Neurosurgery: Spine) were extracted from PubMed. For authors with a complete first name listed, gender was determined by matching first name using an online database containing 216,286 distinct names across 79 countries and 89 languages.

The proportion of female first and senior authors was determined during the time periods 1978-1994, 1995-1999, 2000-2004, 2005-2009, and 2010-2016. Authors who had their first paper published between 2000-2009 were included in additional analyses for publication count and longevity (whether additional articles were published 5 years after first publication). Student’s t-test, chi-squared analysis, and Cochran-Armitage trend test were used to determine significance between groups.

**Results:** From 1978-2016, 28,882 original research articles were published in the five spine-related journals. 24,334 abstracts (90.9%) had first names listed, identifying 120,723 authors in total of which 100,286 were successfully matched to a gender. 33,480 unique authors were identified (female: 31.8%).

Female representation increased for first and senior authors from 6.5% and 4.7% (1978-1994) to 18.5% and 13.6% (2010-2016, p<0.001). Growth in female senior author representation declined after 2000 (12.3% vs. 12.9% vs. 13.5% between 2000-2004, 2005 – 2009, and 2010-2016). Compared to men authors, on average women authors published fewer articles (mean: 2.1 vs 3.3, p<0.001)

Of 15,304 authors who first published during 2000-2009, 3,478 authors (22.7%) continued to publish 5 years after their first publication. Women were less likely to continue publishing after their first article (15.3% of female authors vs. 24.8%, p <0.001).

**Conclusions:** Female representation in academic spine research has doubled over the past 4 decades, although the growth of female representation as senior author has plateaued. Female physician-investigators are half as likely to continue participating in spine-related research longer than 5 years and on average publish half as many articles as senior author. In addition to recruiting more women into research, efforts should be made to identify and address barriers in research advancement and promotion for female physician-investigators.

**Keywords**

Female, diversity, authorship, leadership, large database analysis, gender