Medical Student Authorship Trends: A 10-Year Analysis of Four Major Orthopaedic Journals

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Introduction

Orthopaedics has been a competitive specialty for medical students to match into with the number of applications rising with each subsequent year

- 2015: 885 applicants for 703 positions, match rate = 79.4%
- 2020: 1,177 applicants for 849 positions, match rate = 72.0%.

Independent factors contributing to successful match

- USMLE Step 1 and Step 2 CK
- AOA
- Number of research products

Kan et al. identified increased medical student research publications in *JAMA Internal Medicine* from 2010 to 2018

Orthopaedic research demonstrates an interest in and commitment to the specialty, resulting in applicants applying with more research products each year

- 2016: 8.2 research products
- 2020: 14.3 research products

Objectives

Identify the proportion of medical student publications in major orthopaedic journals

Identify how these trends have changed over time

Materials & Methods

Four orthopaedic journals were selected as they collectively represent both the high-impact, broad coverage of orthopaedic subspecialties and academics

- *The American Journal of Sports Medicine* (AJSM)
- *Clinical Orthopaedics and Related Research* (CORR)
- *Journal of Arthroplasty* (J Arthroplasty)
- *Journal of Bone and Joint Surgery* (JBJS)

Data Collection

- 2011-2020 (10-year period)
- Year
- Number of authors
- Degree(s) of each author
- Sex of each author
- Country and state (if USA)
- Level of evidence (if clinical)
- Clinical vs. non-clinical studies
- Medical students = authors with only a bachelor's degree

Statistical Analysis

- Linear regression used to analyze publication trends over time
- Significance set at <0.05
- Statistical analyses performed using STATA (StataCorp LLC, College Station, TX)

Publications by Journal

Journal	n (%)
J Arthroplasty	5056 (32.1)
CORR	4190 (26.6)
AJSM	3460 (22.0)
JBJS	3034 (19.3)
Total	**15740**

Table 1: Total publications by journal from 2011-2020

First Author Degree(s)

Degree	n (%)
MD	10144 (64.4)
MD, PhD	1411 (9.0)
PhD	1238 (7.9)
Bachelor's	919 (5.8)
Master's	834 (5.3)
MB/MBBS	491 (3.1)
Other	455 (2.9)
DO	120 (0.8)
DPT	63 (0.4)
PhD, DPT	28 (0.2)
PhD, MB/MBBS	28 (0.2)
MD, DPT	8 (0.1)
MD, PhD, DPT	1 (0.0)
Total	**15740**

Table 2: Distribution of overall first author degrees

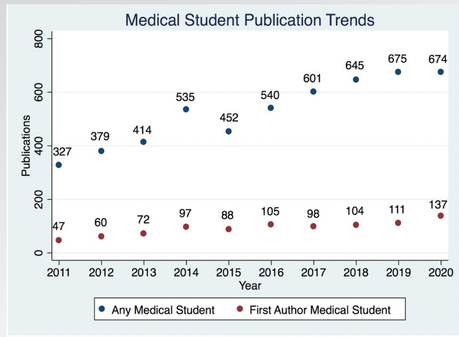

Figure 1: First author and any author medical student publications

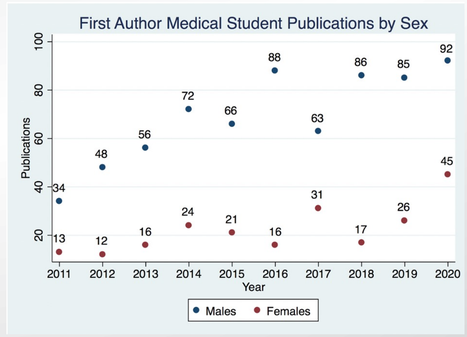

Figure 2: First author medical student publications by sex

Results

Overall

- Total number of articles = 15,740
- Total number of authors = 82,837
- Overall first author sex: males = 84.5%

Medical Students

- Total medical student articles = 3,769
- Total medical students = 5,242
- Medical student first author sex: males = 75.1%

Overall Medical Student Trends

Increase in any author medical student publications

- Coefficient = 40.22; 95% CI: [31.28 to 49.16], **p<0.001**

Increase in first author medical student publications

- Coefficient = 8.16; 95% CI: [5.74 to 10.58], **p=0.001**

No significant change in annual number of overall publications

Medical Student Trends by Sex

Increase in male first author medical student publications

- Coefficient = 5.61; 95% CI: [3.19 to 8.03], **p=0.001**

Increase in female first author medical student publications

- Coefficient = 2.47; 95% CI: [0.66 to 4.28], **p=0.01**

Trends Within USA

States with most overall publications

- New York > California > Pennsylvania

States with most overall first author medical student publications

- New York > Pennsylvania > California

States with most overall any author medical student publications

- New York > Pennsylvania > California

Conclusions

- Increasing medical student research productivity over the last 10 years, despite a constant number in overall orthopaedic publications
- Females constituted 24.0% of first author medical student publications and demonstrated an increasing trend over time
- States with many medical schools and top NIH funding → lots of publications

Limitations

- Unable to determine whether authors will or will not become medical students
- Does not account for authors who were unsuccessful in the match and are reapplying into orthopaedic surgery
- Unable to determine whether authors will apply into orthopaedic surgery
- Medical students were defined as having only a bachelor's degree