Bibliometric analysis of authorship trends and collaboration dynamics over the past three decades of BONE’s publication history

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Article history:
Received 31 August 2017
Revised 25 October 2017
Accepted 27 October 2017
Available online 31 October 2017

Keywords:
Gender
Bibliometric analysis
Authorship trends
Bone

The existence of a gender gap in academia has been a hotly debated topic over the past several decades. It has been argued that due to the gender gap, it is more difficult for women to obtain higher positions. Manuscripts serve as an important measurement of one’s accomplishments within a particular field of academia. Here, we analyzed, over the past 3 decades, authorship and other trends in manuscripts published in BONE, one of the premier journals in the field of bone and mineral metabolism. For this study, one complete year of manuscripts was evaluated (e.g. 1985, 1995, 2005, 2015) for each decade. A bibliometric analysis was then performed of authorship trends for those manuscripts. Analyzed fields included: average number of authors per manuscript, numerical position of the corresponding author, number of institutions collaborating on each manuscript, number of countries involved with each manuscript, number of references, and number of citations per manuscript. Each of these fields increased significantly over the 30-year time frame (p < 10^-16). The gender of both the first and corresponding authors was identified and analyzed over time and by region. There was a significant increase in the percentage of female first authors from 23.4% in 1985 to 47.8% in 2015 (p = 0.001). The percentage of female corresponding authors also increased from 21.2% in 1985 to 35.4% in 2015 although it was not significant (p = 0.07). With such a substantial emphasis being placed on publishing in academic medicine, it is crucial to comprehend the changes in publishing characteristics over time and geographical region. These findings highlight authorship trends in BONE over time as well as by region. Importantly, these findings also highlight where challenges still exist.

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1. Introduction

According to the dictionary definition, the “gender gap” simply refers to the differences between men and women in areas such as economics, politics, etc. [1]. However, in more recent years, it has come to denote disparities in compensation (including financial and corporate/academic position) between men and women with equal skills and training [2]. The biggest question has become “why?” Why does this gap exist, and what factors created this gap? As of 2017, women make up 49.6% of the world population [3]. Since the end of World War II, the percentage of female students in universities increased from 32% to 56% [4]. With such statistics, it would seem intuitive that women should also hold ~50% of professional-level jobs. However, women only hold 14.6% of CEO positions and only comprise 8.1% of top earners financially [5]. These discrepancies are similar in medicine. Women comprise 47% of medical students and 46% of residents; however, they account for 21% of full-time professors, 15% of department chairs, and 16% of deans [6–8]. As publications are an important indicator of a person’s scholarly output and reputation, one of the factors responsible for this discrepancy in professional equality may be the number of publications.

The primary purpose of a publication is to advance knowledge in a given field. In academia, publications are also a crucial factor for personal advancement in both the field and the promotion tenure track [9–14]. Additionally, publications are gaining importance in the application process for professional schools, graduate schools, and residency programs [15]. Reviewing the authorship trends of academic journals, as well as the correlation to the increase in females pursuing academic roles, provides valuable information regarding the degree to which the gender gap does or does not prevail and likely future trends for women in academic medicine.
The journal BONE focuses on “basic, translational and, clinical aspects of bone and mineral metabolism” [16]. It was hypothesized the while the percentage of female authors would increase overtime, the percentage of females authors would still be lower than the percentage of male authors, even in 2015. Therefore, the purpose of this study to undertake a historical analysis of BONE with a specific focus on authorship gender.

2. Materials and methods

2.1. Data collection process: manuscripts

Authorship trends in BONE were performed over a 30 year period. The data was analyzed in ten-year intervals dating from 1985 to 2015. This periodic sampling technique has been previously described and validated [17–21]. We selected 1985 as the starting year, and 2015 as the final year, as it was the most recent year with a complete set of publications since our study commenced in 2016. The gender of both the first author and the corresponding author were documented, which allowed us to analyze gender of both authors. We also studied other demographics including geographic location and other bibliometric variables.

All articles in the journal for each of the sample years were included except for editorials, letters, and commentaries. EndNote X7 (Clarivate Analytics, Philadelphia, PA) was used to examine and organize the publications from these journals. Publications that did not contain an author were excluded as well as memorandums, meeting notes, and abstracts except for editorials, letters, and commentaries. EndNote X7 (Clarivate Analytics, Philadelphia, PA) was used to examine and organize the publications from these journals. Publications that did not contain an author were excluded as well as memorandums, meeting notes, and abstracts except for editorials, letters, and commentaries. The number of times each publication had been typesetted etc. (e.g. e-pub ahead of print) for that specific year but not published until the following year. The organized EndNote data was then exported into a Microsoft Excel (Microsoft, Redmond, WA) file.

The countries in which the corresponding author resided was noted; the state or province for those in the United States or Canada was also tabulated. The chronological author position of the corresponding author (e.g. 1, 2, 3, …, last author) was captured. The number of references cited, and publication length (total printed page number). The number of times each publication had been cited was also recorded, and was obtained via a Scopus search of each specific publication. All Scopus searches were completed in November of 2016.

Gender was identified for both the first and corresponding authors using a “Baby Name Guesser” website (http://www.gpeterson.com/names/baby-names.php) [17]. This approach has been used and validated by others [17–21]. In brief, the first name was entered and the website provided a most likely gender as well as a gender ratio. A ratio of 0.3 or higher was considered to be a correct identification of gender. If a ratio of < 0.3 was obtained, then the author’s gender was confirmed via a Google search. If the search did not result in confirming the author’s gender, then the entry was excluded. For corresponding authors, 2.8% of all entries were excluded and for first authors 2.7% were excluded.

2.2. Assignment of geographical region: manuscripts

Countries were organized into groups by region for the corresponding author. Countries were assigned to the authors based on the location of corresponding author’s institution(s). Canada and the United States of America were considered to be North America. Mexico, Central and South America were grouped as Latin America. All European countries, as well as Turkey and Russia were grouped into the Europe category. Asia was all Asian countries starting west of Turkey as well as the Middle East and Israel. The other regions were described as Africa and Australia/New Zealand, the latter we define as Oceania for the purposes of this study.

2.3. Editorial board data collection

The composition of the editorial board was identified during the years studied (1985, 1995, 2005, and 2015). Specifically, the names and countries of residence for editor(s), managing editor(s), associate editor(s), and editorial board members was collected. The names were analyzed as detailed above for gender and the countries were grouped into regions as described above.

2.4. Statistical analysis

Continuous data are reported as the mean ± 1 standard deviation. Discrete data are reported as frequencies and percentages. Analyses between groups of continuous data were performed using non-parametric tests due to the data not having normal distributions (Mann-Whitney U–2 groups; Kruskal-Wallis test – 3 or more groups). Differences between groups of discrete data were analyzed by the Fisher’s exact test (2 × 2 tables) and the Pearson’s χ² test (>2 × 2 tables). Trends over time (2 × k tables) were analyzed with the Cochran linear trend test. For all statistical analyses a p < 0.05 was considered statistically significant. Statistical analyses were performed with Systat 10 software™ (Systat Software, Chicago, Il.).

3. Results

A total of 899 publications met the inclusion requirements; there were 67 from 1985, 258 from 1995, 219 from 2005, and 355 from 2015.

3.1. Analyses by region

Due to the small number of manuscripts from Africa and Latin America, these regions were excluded from further analyses (2.2% of total manuscripts). The percentage of publications originating from the included regions was: 39.5% for North America, 36.9% for Europe, 16.4% for Asia, and 5.0% for Oceania.

The distribution of publications by individual countries and states/provinces was analyzed (Fig. 1). For North America, 87.9% came from the United States and 12.1% from Canada. Within the United States, California, Massachusetts, and New York had the most manuscripts and accounted for 28.5% of the United States’ manuscripts (Fig. 1A). For Europe, 37.6% originated in France and the United Kingdom (Fig. 1B). For Oceania, 95.5% originated from Australia (Fig. 1C). For Asia, 71.4% originated from Japan and China (Fig. 1D).

3.2. Trends over time and region

The number of publications increased from 67 in 1985 to 355 in 2015 (Fig. 2A). The average number of authors increased from 3.6 ± 1.6 in 1985 to 7.1 ± 3.6 in 2015 (Fig. 2B). The corresponding author position (e.g. 1st, 2nd, 3rd, etc., last) increased from 1.4 ± 0.9 in 1985 to 4.3 ± 3.8 in 2015 (Fig. 2B). The number of institutions collaborating per manuscript increased from 1.5 ± 0.7 in 1985 to 2.9 ± 2.0 in 2015 and the number of countries collaborating per manuscript increased from 1.2 ± 0.4 in 1985 to 1.5 ± 0.9 in 2015 (Fig. 2C). The average number of printed pages per manuscript increased from 5.8 ± 2.4 in 1985 to 8.4 ± 2.3 in 2015 (Fig. 2D). The average number of references per manuscript increased from 24 ± 14 in 1985 to 52 ± 1 in 2015 (Fig. 2E). Due to the fact that the 2015 manuscripts had only been published for a single year at the time the data was collected, the citation data we quote was normalized by dividing the amount of times the composition was cited by the age of the manuscript (31 for 1986, 21 for 1995, 11 for 2005, and 1 for 2015). Using this normalized citation method, the number of times each paper was cited increased significantly from 0.9 ± 1.1 in 1985 to 3.6 ± 4.3 in 2015 (Fig. 2F). All of these changes over time were significant (p < 10⁻⁶). The publications were also analyzed using the same parameters based on the region of origin. There were 356 manuscripts from North America,
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امکان دانلود نسخه تمام متن مقالات انگلیسی
امکان دانلود نسخه ترجمه شده مقالات
پذیرش سفارش ترجمه تخصصی
امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
امکان دانلود رایگان ۲ صفحه اول هر مقاله
امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
دانلود فوری مقاله پس از پرداخت آنلاین
پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات